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Personal Narrative

OF TRAVELS

TO THE

EQUINOCTIAL REGIONS

OF THE

NEW CONTINENT,

DURING THE YEARS 1799—1804,

BY

ALEXANDER DE HUMBOLDT,

AND

AIMÉ BONPLAND;

88188

WITH MAPS, PLANS, &c.

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ADVERTISEMENT

(*BY THE ENGLISH EDITOR.*)

The scene to which this volume chiefly relates—the Republic of Columbia—having become an object of such deep and general interest, the publishers have pleasure in at length presenting it to the public. The French original had been delayed by circumstances over which the editor had no controul. The succeeding portion, which will comprise an account of the island of Cuba, and a part of the Journey into the Cordillera of the Andes, is already in the press, and proceeding with all possible expedition. The Author having, in the course of the work, brought under his review almost all branches of the Sciences, purposes to give, at the conclusion of the whole, a classed table of contents, or methodical index, for the facility of reference.

The present volume comprehends, besides the Personal Narrative of the travellers, The History of the Nations of Carib race; a general view of the Population of Spanish America, arranged according to difference of colour, of languages, and of religion; a discussion of the great problem of an Oceanic Canal, or of a Water Communication between the South Sea and the Atlantic Ocean, with reference both to its utility and the obstacles which local circumstances may present to its execution; a comparison of the more ancient Monuments of the Aboriginal Inhabitants of both Americas; a Geological View of South America on the north of the river of the Amazons, with a general account of the ramifications of the knots of mountains which occur in the Andes from Cape Horn to the Polar Circle; a memoir on the Horary Variations of the Barometer within the Tropics, both at the level of the ocean, and on the summit of the Cordillera of the Andes; and a compressed view of thermometric, hygrometric, cyanometric, and electrometric observations made in the low equinoctial regions.

With this volume are given, a general map of the Republic of Columbia, drawn from the latest scientific observations and discoveries; and a map of the *Geography of the Plants of Chimborazo*, indicating the elevation at which they are respectively found.

CONTENTS

OF VOL. VI. PART I.

BOOK IX.

CHAPTER XXV.

PAGE

Llanos Del Pao, or the eastern part of the Plains (Llanos) of Venezuela.—Missions of the Caribbees.—Last abode on the coast of Nueva Barcelona, Cumana, and Araya - - - - - - - - - 1

CHAPTER XXVI.

Explanations - - - - - - - - - 128
A—Population of Continental America - - - 129
B—Area of the same - - - - - - - 143
Relation of the Population to the Extent of Surface - 181
Productions - - - - - - - - - - 200
Commerce and Public Revenue - - - - - 219
The Practicability of a Water Communication between the Atlantic and Pacific Oceans discussed - - 239

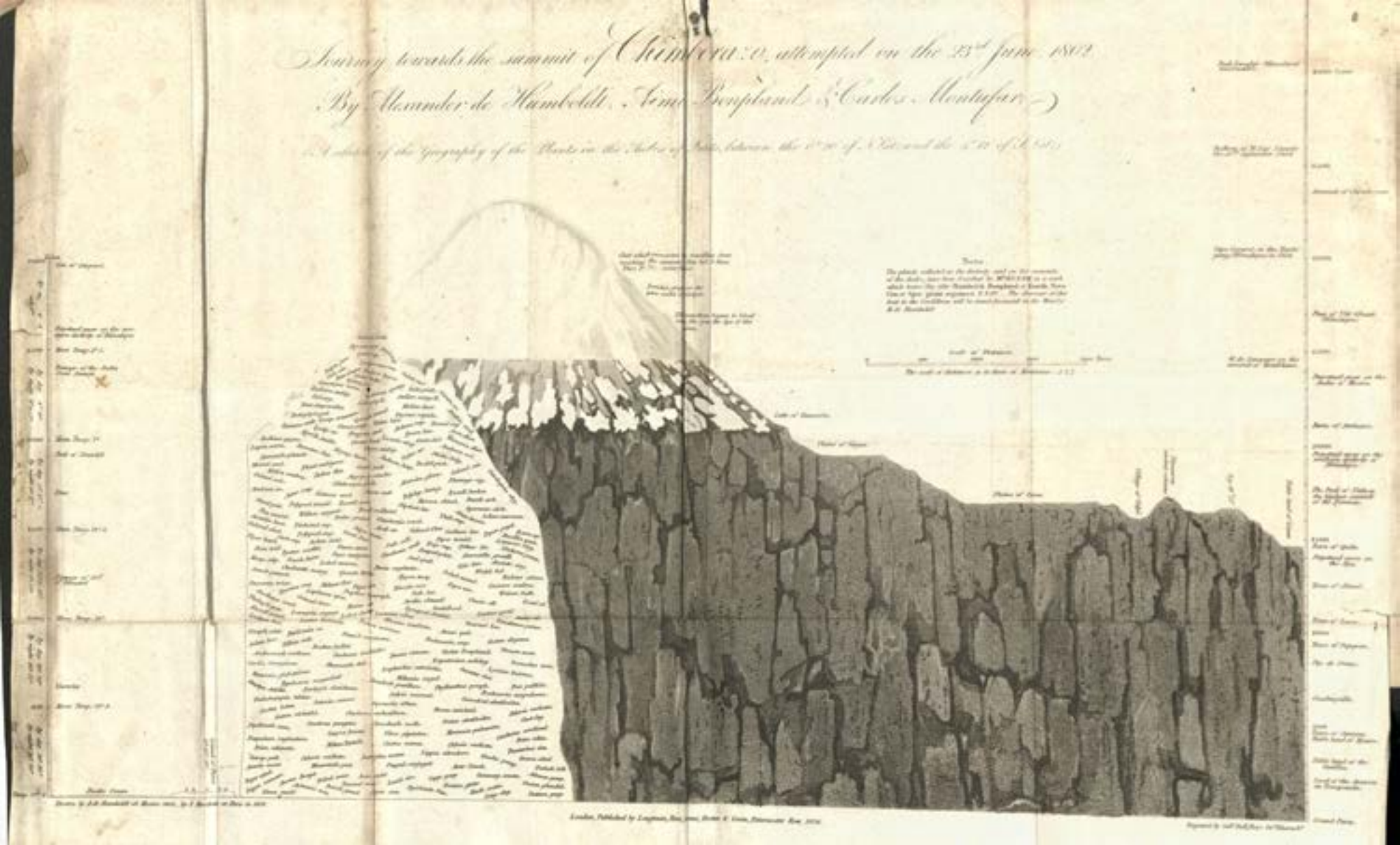
NOTES TO THE NINTH BOOK.

A—Antiquities, &c. of the Aboriginal Inhabitants of America - - - - - - - - - - 315
B—Relative Population by the Square League of the American States, and the States of Europe, Asia, and Africa - - - - - - - - - - 335
C—State of the Catholic Missions in Spanish America Sketch of the Native Tribes of ditto - - - 347
D—Population of Buenos Ayres - - - - 363
E—Population of the United States, N. A. - - 367
F—On the Boundaries of the Spanish and Portuguese States - - - - - - - - - 378
G—On the Physical Properties of the Cow Tree - 386

Journey towards the summit of Chimborazo, attempted on the 23rd June 1802

By Alexander de Humboldt, Aimé Bonpland & Carlos Montufar

A sketch of the geography of the Plants in the Andes of Peru, between the 1° 30' of N. and the 3° 30' of S. Lat.



Drawn by A.de Humboldt at Mexico 1803. & P. Bouvier at Paris in 1810.

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JOURNEY

TO THE

EQUINOCTIAL REGIONS

OF

THE NEW CONTINENT.

BOOK IX.

CHAPTER XXV.

Llanos Del Pao, or the eastern part of the Plains (Llanos) of Venezuela. Missions of the Caribbees. Last abode on the coast of Nueva Barcelona, Cumana, and Araya.

It was night when we crossed for the last time the bed of the Oroonoko. We purposed to rest near the little fort of San Rafael, and the next morning at daybreak to begin our journey through the steppes of Venezuela. Nearly six weeks had elapsed since our arrival at Angostura; and we earnestly wished to reach the coast, in order to find a vessel at Cumana, or at Nueva-Barcelona, in which we might embark for the island of Cuba, and proceed thence

to Mexico. After the sufferings to which we had been exposed during several months, by sailing in small boats on rivers infested by moschettoes, the idea of a long sea-voyage had some charms for the imagination. We meant to return no more to South America. Sacrificing the Andes of Peru to the Archipelago of the Philippines, of which so little is known, we adhered to our old plan of remaining a year in New Spain, proceeding in the galleon from Acapulco to Manilla, and returning to Europe by the way of Bassora and Aleppo. It appeared to us, that, when we had once left the Spanish possessions in America, the fall of that ministry, which with noble confidence had procured us such unlimited permissions, could not be prejudicial to the execution of our enterprise. Our minds were agitated by these ideas during our monotonous journey across the steppes. Nothing enables us better to endure the little contrarieties of life, than our attention being engaged by the approaching accomplishment of a hazardous undertaking.

Our mules waited for us on the left bank of the Oroonoko. The collections of plants, and the different *geological series*, which we had brought from the Esmeralda and the Rio Negro, had greatly augmented our baggage; and, as it would have been dangerous to lose sight of our herbals, we expected to make a very slow

journey across the Llanos. The heat was excessive, on account of the reverberation of the soil, almost every where destitute of plants. The centigrade thermometer however during the day (in the shade) was only from thirty to thirty-four degrees, and at night from twenty-seven to twenty-eight degrees. Here therefore, as almost every where within the tropics, it was less the absolute degree of heat, than it's duration, that affected our organs. We were thirteen days in crossing the steppes, resting a little in the Caribbee (*Caraïbes*) missions, and in the little town of Pao. I have given already * the physical picture of those immense plains, which separate the forests of Guyana from the chain of the coast. The eastern part of the Llanos, through which we passed, between Angostura and Nueva Barcelona, wears the same savage aspect as the western part, by which we came from the valleys of Aragua to San Fernando de Apure. In the season of drought, which it is here agreed to called *summer*, though the Sun is in the southern hemisphere, the breeze is felt with greater force in the steppes of Cumana, than in those of Caraccas; because these vast plains, like the cultivated fields of Lombardy, form an inland basin, open to the east and closed on the north, south, and west,

* Vol. iv, p. 290—415.

by high chains of primitive mountains. Unfortunately, we could not avail ourselves of this refreshing breeze, of which the *Llaneros* (the inhabitants of the steppes) speak with rapture, it being the rainy season north of the equator; and though it did not rain in the steppes, the change in the declination of the Sun had long caused the action of the polar currents to cease. In those equatorial regions, where you can find your course by observing the direction of the clouds, and where the oscillations of the mercury in the barometer indicate the hour almost as well as a clock, every thing is subject to a regular and uniform type. The cessation of the breezes, the beginning of the rainy season, and the frequency of electric explosions, are phenomena, which are found to be connected by immutable laws.

At the confluence of the Apure and the Oroonoko, near the mountain of Sacuima, we had met with a French farmer, who lived amid his flocks in the most absolute seclusion*. This was the man, who in his simplicity believed, that the political revolutions of the old world, and the wars which have been the consequence, were owing solely "to the long resistance of the monks of the Observance." We had scarcely entered the Llanos of Nueva Barcelona, when

* Vol. v, p. 677.

we again found a Frenchman, at whose house we passed the first night, and who received us with the kindest hospitality. He was a native of Lyons; had left his country at a very early age; and appeared extremely indifferent to all that was passing beyond the Atlantic, or, as they say here, disdainfully enough for Europe, "on the other side of the great pool" (*del otro lado del charco*). Our host was employed in joining large pieces of wood by means of a kind of glue called *guayca*. This substance, used by the carpenters of Angostura, resembles the best glue extracted from the animal kingdom. It is found perfectly prepared between the bark and the alburnum of a creeper* of the family of the *combretaceæ*. It probably resembles in it's chemical properties birdlime, the vegetable principle obtained from the berries of the mistleto, and the internal bark of the holly. An astonishing abundance of this glutinous matter issues from the twining branches of the *vejuco de guayca* when they are cut. Thus, we find within the tropics a substance in a state of purity, and deposited in peculiar

* Combretum *guayca*. It might be thought, that the name of chigommier, given by botanists to the different species of combretum, has an allusion to this glutinous matter; but the name is derived from *chigouma* (combretum laxum, *Aubl.*), a word of the Galibi or Caribbee language.

organs, which in the temperate zone can be procured only by the processes of art *.

We arrived on the third day at the Caribbee missions of Cari. We observed, that the ground was less cracked by the drought in this country than in the *Llanos* of Calabozo. Some showers had revived the vegetation. Small gramina, and especially those herbaceous sensitive plants, that are so useful in fattening half-wild cattle, formed a thick turf. A few fan palms (corypha tectorum), rhopalas † (*chaparro*), and malpighias ‡ with coriaceous and glossy leaves, arose at great distances from each other. The humid spots are recognized at a distance by groups of mauritia, which are the sago-trees of those countries. Near the coast this palm-tree constitutes

* Vol. v, p. 286.

† The proteaceæ are not, like the araucaria, an exclusively southern form. (*Kotzebue, Reise*, vol. iii, p. 13.) We found the rhopala complicata, and the r. obovata, in 2° 30′ and in 10° of north latitude. See our *Nov. Gen.*, vol. ii, p. 153.

‡ A neighbouring genus, byrsonima *cocollobæfolia*, b. *laurifolia* near Matagorda, and b. *ropalæfolia*. The European planters, who from the feeblest analogies believe, that they find every where the plants of their own country in the vegetation of the tropics, call the malpighia, *alcornoque* (cork-tree), no doubt on account of the *suberous* bark of the trunk. This bark contains tannin; and in another malpighia (byrsonima moureila), which is the febrifuge tree of Cayenne, the quinquina, or cinchonin is supposed, not without reason, to exist united with the tannin.

the whole wealth of the Guaraon Indians; and it is somewhat remarkable, that we had found it again one hundred and sixty leagues farther south, in the midst of the forests of the Upper Oroonoko, in the savannahs that surround the granitic peak of Duida*. It was loaded at this season with enormous clusters of red fruit, resembling the cones of firs. Our monkeys were extremely fond of this fruit, which has the taste of an overripe apple. These animals, placed with our baggage on the backs of the mules, made great efforts to reach the clusters, that were suspended over their heads. The plain was undulating from the effect of the *mirage*†; and when, after travelling for an hour, we arrived at these trunks of the palm-tree, which appeared like masts in the horizon, we observed with astonishment how many things are connected with the existence of a single plant. The winds, losing their velocity when in contact with the foliage and the branches, accumulate sand around the trunk. The smell of the fruit, and the brightness of the verdure, attract from afar the birds of passage, which delight in the vibrating motion of the

* The murichi, like the sagus Rumphii, is a *palm-tree of the marshes* (vol. iii, p. 278; vol. iv, p. 334; vol. v, 50, 550, and 726); not a *palm-tree of the coast*, like the chamærops humilis, the common cocoa-tree, and the lodoicea.

† Vol. ii, p. 196; iv, 327.

branches of the palm-tree. A soft murmuring is heard around; and overwhelmed by the heat, and accustomed to the melancholy silence of the steppes, we fancy we enjoy some coolness at the slightest sound of the foliage. If we examine the soil on the side opposite to the wind, we find it remains humid long after the rainy season. Insects and worms *, every where else so rare in the *Llanos*, here assemble and multiply. This one solitary and often stunted tree, which would not claim the notice of the traveller amid the forests of the Oroonoko, spreads life around it in the desert.

On the 13th of July we arrived at the village of Cari †, the first of the Caribbee missions, that are under the monks of the *Observance* of the college of Piritu ‡. We lodged as usual at the *convent*, that is with the clergyman. We had, beside our passports from the captain-

* What are those worms (*loul* in Arabic), which captain Lyon, the fellow-traveller of my brave and unfortunate friend Mr. Ritchie, found in the pools of the desert of Fezzan, which served the Arabs for food, and which have the taste of *caviare?* Are they not insects' eggs, resembling the *aguautle*, which I saw sold in the market at Mexico, and which are collected on the surface of the lakes of Texcuco? (*Gazeta de Litteratura de Mexico*, 1794, vol. iii, No. 26, p. 201.)

† N^ras S^ra del Socorro del Cari, founded in 1761.

‡ These missionaries are called *padres missioneros Observantes del Colegio de la Purissima Concepcion de Propaganda Fide en la Nueva Barcelona.*

general of the province, recommendations from the bishops and the guardian of the missions of the Oroonoko. From the coasts of New California to Valdivia and the mouth of the Rio de la Plata, a space of two thousand leagues, every difficulty of a long journey by land may be surmounted, if the traveller enjoy the protection of the American clergy. The power which this body exercises in the state is too well established, to be soon shaken by a new order of things. Our host could scarcely comprehend, "how natives of the north of Europe could arrive at his dwelling from the frontiers of Brazil by the Rio Negro, and not by way of the coast of Cumana." He behaved to us however in the most affable manner, and showed a curiosity somewhat importunate respecting us, which the appearance of a stranger, who is not a Spaniard, always excites in South America. The minerals, which we had collected, must contain gold; the plants, dried with so much care, must be medicinal. Here, as in many parts of Europe, the sciences are thought worthy to occupy the mind only so far as they confer some solid benefit on society.

We found more than five hundred Caribbees in the village of Cari; and saw many others in the surrounding missions. It is curious to observe a nomade people, recently attached to the soil, and differing from all the other Indians in

their physical and intellectual powers. I have no where seen a taller race of men (from five feet six inches, to five feet ten inches*), and of a more colossal stature. The men, which is common in America†, are more clothed than the women. The latter wear only the *guajuco*, or *perizoma*, in the form of a band. The men have the lower part of the body as far as the hips wrapped in a piece of blue cloth, so dark as to be almost black. This drapery is so ample, that, when the temperature lowers toward the evening, the Caribbees throw it over their shoulders. Their bodies being tinged with *onoto*‡, their tall figures, of a reddish copper-colour, with their picturesque drapery, projecting from the horizon of the steppe against the sky as a back ground, resemble antique statues of bronze. The men cut their hair in a very characteristic manner; like the monks, or the children of the choir. A part of the forehead is shaved, which makes it appear extremely large. A large tuft of hair, cut in a circle, begins very near the top of the head. This resemblance of the Caribbees to the monks is not the result of living in the missions; it is not owing, as it has been errone-

* From five feet nine inches to six feet two, English, nearly.

† See above, vol. v, p. 362.

‡ *Rocou*, obtained from the bixa orellana. This paint is called in Caribbee *bichet*.

ously asserted, to the desire of the natives to imitate their masters, the fathers of the order of Saint Francis. The tribes, that have preserved their savage independance, between the sources of the Carony and the Rio Branco, are distinguished by the same *cerquillo de frailes*, which the first Spanish historians* at the time of the discovery of America attributed to the nations of Caribbee origin. All the men of this race, whom we saw either during our voyage on the Lower Oroonoko, or in the missions of Piritoo, differ from the other Indians not only by their tallness, but also by the regularity of their features. Their nose is not so large, and less flattened; the cheek-bones are not so high; and their physiognomy has less of the Mongul cast. Their eyes, darker than those of the other hordes of Guyana, denote intelligence, I had almost said the habit of reflexion. The Caribbees have a gravity in their manners, and something of sadness in their look, which is found for the most part among the primitive inhabitants of the New World. The expression of severity in their features is singularly in-

* "Regio ab incolis Caramaira dicitur, in qua viros simul "et fœminas statura aiunt pulcherrimos esse, nudos tamen, "capillis aure tenus scissis mares, fœminas oblongis. A Ca- "ribibus, sive Canibalibus, carnium humanarum edacibus, "originem traxisse Caramairenses existimant." *Petr. Martyr, Ocean.* (1533), p. 25. D et 26 B.

creased by the rage they have for dying their eyebrows with the juice of the caruto*, enlarging them, and joining them together. They often mark the whole face with black spots, in order to appear more savage. The magistrates of the place, the *Governador* and the *Alcades*, who alone have the privilege of carrying long canes, came to visit us. Among them were some young Indians from eighteen to twenty years of age, the choice depending solely on the will of the missionary. We were struck at finding among these Caribbees painted with arnotta the same airs of importance, the stiff mien, and the cold and disdainful manners, which are sometimes to be met with among people in office, in the old continent. The Caribbee women are less robust, and uglier than the men. On them devolves almost the whole burden of domestic labours, no well as those of the fields. They asked us with earnestness for pins; which, having no pockets, they placed under the lower lip, piercing the skin, so that the head of the pin remained within the mouth. The young girls are dyed with red; and, except the *guajuco*, are naked. Among the different nations of the two worlds the idea of nudity is altogether relative. A woman in some parts of Asia is not permitted to show the

* See vol. iv, p. 519.

end of her fingers; while an Indian of the Caribbee race is far from considering herself as naked, when she wears a *guajuco* two inches broad. Even this band is regarded as a less essential part of dress than the pigment, which covers the skin. To go out of the hut without being painted with arnotta, is to transgress all the rules of Caribbean decency.

The Indians of the missions of Piritoo attracted still more our attention on account of their belonging to a nation, which by it's daringness, it's warlike enterprises, and it's mercantile spirit, has exerted a great influence on the vast country, that extends from the equator toward the northern coasts. We found traces every where on the Oroonoko of the hostile incursions of the Caribbees, which they pushed heretofore from the sources of the Carony and the Erevato as far as the banks of the Ventuari, the Atacavi, and the Rio Negro*. The Caribbean language is consequently the most general in this part of the world; it has even passed (like the language of the Lenni-Lenapes, or Algonkins, and the Natchez or Muskoghees, on the west of the Alleghany mountains) to tribes which have not the same origin.

When we cast a look on that swarm of nations spread over both Americas to the east

* Vol. v, p. 204, 209, 360.

of the Cordilleras of the Andes, we fix our attention particularly on those, who, having long held the sway over their neighbours, have acted a more important part on the stage of the world. It is the object of the historian, to group facts, to distinguish masses, to ascend to the common sources of so many migrations and popular movements. Great empires, the regular organization of a sacerdotal hierarchy, and the culture which this organization favors in the first age of society, are found only on the high mountains of the west. At Mexico we see a vast monarchy enclosing small republics; at Cundinamarca and Peru, real theocracies. Fortified towns, highways and large edifices of stone, an extraordinary developement of the feudal system, the separation of casts, convents of men and women, religious congregations following a discipline more or less severe, very complicated divisions of time connected with the calendars*, zodiacs, and astrology of the enlightened nations of Asia, are phenomena, that in America belong to one region only, the long and narrow Alpine band, which extends from thirty degrees of north latitude to twenty-five degrees south. The flux of nations in the ancient world was from east to west; the Basques or Iberians, the Celts, the Germans,

* See the note *A* at the end of the ninth book.

and the Pelasgians, appeared in succession. In the New World similar migrations flowed from north to south. Among the nations that inhabit the two hemispheres, the direction of this movement followed that of the mountains; but, in the torrid zone, the temperate table-lands of the Cordilleras exerted a greater influence on the destiny of mankind, than the mountains of Asia and central Europe. As, properly speaking, civilized nations only have a history, that of the Americans is necessarily no more than the history of a small number of the inhabitants of the mountains. A profound obscurity envelopes the immense country, that stretches from the eastern slope of the Cordilleras toward the Atlantic; and, for this very reason, whatever in this country relates to the preponderance of one nation over others, to distant migrations, to the physiognomical features which denote a foreign race, excite in us a lively interest.

Amid the plains of North America, some powerful nation, which has disappeared, had constructed circular, square, and octagonal fortifications; walls six thousand toises in length; tumuli from seven to eight hundred feet in diameter, and one hundred and forty feet in height, sometimes round, sometimes with several stories, and containing thousands of skeletons. These skeletons belonged to men less slender, and more squat, than the present inha-

bitants of those countries. Other bones, wrapped in fabrics resembling those of the Sandwich and Feejee islands, are found in the natural grottoes of Kentucky. What is become of those nations of Louisiana anterior to the Lenni-Lenapes, the Shawanese, and perhaps even to the Sious (Nadowesses, Narcotas) of the Missouri, who are strongly *mungolized;* and who, it is believed, according to their own traditions, came from the coast of Asia? In the plains of South America, as I have elsewhere observed, we scarcely find a few hillocks (*cerros hechos a mano*), and no where any works of fortification analogous to those of the Ohio. On a vast space of ground however, at the Lower Oroonoko as well as on the banks of the Cassiquiare and between the sources of the Essequibo and the Rio Branco, there are rocks of granite covered with symbolic figures. These sculptures denote, that the generations extinct belonged to nations different from those, which now inhabit the same regions. There seems to be no connection between the history of Mexico, and that of Cundinamarca and of Peru, at the west, on the back of the Cordilleras; but in the plains of the east a warlike and long ruling nation displays in it's features, and it's physical constitution, traces of a foreign origin. The Caribbees preserve traditions, that seem to indicate some ancient communications be-

tween the two Americas. Such a phenomenon deserves particular attention, whatever may have been the degree of barbarism and degradation, in which all the nations of the plains of the New Continent were found by the Europeans at the end of the fifteenth century. If it be true, that savages are for the most part degraded races, remnants escaped from a common shipwreck, as their languages, their cosmogonic fables, and a crowd of other indications seem to prove, it becomes doubly important to examine the paths, by which these remnants have been driven from one hemisphere to the other.

The fine nation of Caribbees now inhabits but a small part of the country, which it occupied at the time of the discovery of America. The cruelties exercised by the Europeans have made them disappear entirely from the West India islands, and the coasts of Darien; while, subjected to the government of the missions, they have formed populous villages in the provinces of New Barcelona and Spanish Guyana. I believe the Caribbees, who inhabit the Llanos of Piritoo, and the banks of the Carony and the Cuyuni, may be estimated at more than thirty-five thousand. If we add to this number the independant Caribbees, who live west of the mountains of Cayenne and Pacaraymo, between the sources of the Essequibo and the Rio Branco, we shall no doubt obtain a total

of forty thousand individuals of pure race, unmixed with any other race of natives. I dwell the more on these observations; because, previously to my travels, the Caribbees were mentioned in many geographical works as an extinct race *. Unacquainted with the interior of the Spanish colonies of the continent, these writers supposed, that the small islands of Dominica, Guadaloupe, and Saint Vincent, had been the principal abodes of this nation, of which all that remains throughout the whole of the eastern West India islands are skeletons † that are petrified, or rather enveloped in a limestone containing madrepores. According to this supposition the Caribbees must have disappeared in America, as the Guanches in the archipelago of the Canaries.

Tribes, which belong to the same people, recognise a common origin, and call themselves by the same name. That of one horde is generally

* Polit. Essay, vol. i, p. 83.

† These skeletons were discovered in 1805 by Mr. Cortez, whose interesting geological observations I have already had occasion to mention (vol. iv, p. 41, 42). They are enchased in a formation of madrepore breccia, which the Negroes call with great simplicity the *masonry of God almighty*; and which, as recent as the *travertin* of Italy, envelopes fragments of vases and other works of man. Mr. Dauxion Lavaysse, and Dr. Kœnig, first made known in Europe this phenomenon, which has so much excited the attention of geologists. (Phil. Tr. 1814, plate 3; *Cuvier, Ossem. foss.*, vol. 1, p. lxvi.)

given to all the rest by the neighbouring nations; sometimes also the names of places become the denominations of a people, or these appellations take rise from an epithet of derision, or the fortuitous alteration of a word ill-pronounced. The name of Caribbees, which I find for the first time in a letter of Peter Martyr d'Anghiera*, is derived from Calina and Caripuna, the *l* and *p* being transformed into *r* and *b*. It is indeed very remarkable, that this name, which Columbus heard pronounced by the people of Haïti †, was found at the same time among the Caribbees of the islands and those of the continent. From the word Carina, or Calina, has been formed Galibi (Caribi); a denomination by which a tribe is known in French Guyana ‡,

* *Petr. Mart. Epist. ad Pomp. Letum* (*Non. Dec.* 1494) *Lib. VII, No.* 147, *fol.* xxxv; and *Ocean., Lib. I, fol.* 2, *A.* According to the Caribbee pronunciation; *balana* and *parana*, the sea, are confounded together.

† Fern. Col., *Cap.* 34; in Churchill's Coll., vol. 2, p. 538. *Herera, Dec. I*, p. 34.

‡ The Galibis (Calibitis), the Palicours, and the Acoquouas, have also the custom of cutting the hair in the manner of the monks; and of applying bandages to the legs of their children, in order to swell the muscles. They have the same predilection for *green stones* (saussurite), which we recognized among the Caribbee nations of the Oroonoko (vol. v, p. 383). There exist besides in French Guyana twenty Indian tribes, which are distinguished from the Galibis, though their language proves, that they have a common origin. *Barrère, France équin.*, p. 121, 239. *Lescallier, sur la Guyane*, p. 78.

of a much more diminutive stature than the inhabitants of Cari, but speaking one of the numerous dialects of the Caribbean tongue. The inhabitants of the islands are called Calinago in the language of the men; and in that of the women, Callipinan. This difference in the language of the two sexes is more striking among the people of the Caribbean race, than among other American nations (the Omaguas, the Guaranis and the Chiquitoes), where it applies only to a small number of ideas, for instance, the words mother and child. It may be conceived that women, from their separate way of life, frame particular terms, which men will not adopt. Cicero* observes, that ancient forms are best preserved by women, because their situation in society exposes them less to those vicissitudes of life (changes of place and occupation), which tend to alter the primitive purity of the language among men. But the contrast in the Caribbee nations between the dialect of the two sexes is so great, that to explain it in a satisfactory manner we must have recourse to another cause; and this may perhaps be found† in the barbarous custom, practised by those nations, of

* *Cicero, de Orat., lib. III, cap.* xii, § 45, *ed. Verburg.* "Facilius enim mulieres incorruptam antiquitatem conservant, quod multorum sermonis expertes ea tenent semper, quæ prima didicerunt."

† See above, vol. v, p. 293 and 420.

killing their male prisoners, and carrying the wives of the vanquished into captivity. When the Caribbees made an irruption into the archipelago of the West India islands, they arrived there as a band of warriors, not as planters accompanied by their families. The language of the female sex was formed by degrees, as the conquerors contracted alliances with the foreign women; it was composed of new elements, words distinct from the Caribbee words*, which in the interior of the gynæceums were transmitted from generation to generation, but on which the structure, the combinations, the grammatical forms of the language of the men exerted their influence. What then took place in a small community we now find in the whole group of the nations of the New Continent. The American languages, from Hudson's bay to the straits of Magellan, are in general characterized by a total disparity of words joined with a great analogy in their structure. They are like different substances clothed in analogous forms. If we recollect, that this phenomenon comprehends one whole side of our planet, almost from pole to pole; if we consider the assimilations, that exist in the grammatical

* The following are examples of the difference between the language of the men (*m*), and the women (*w*); *isle*, oubao m., acaera w.; *man*, ouekelli m., eyeri w.; *but*, irhen m., atica w.

forms (in the genders applied to the three persons of the verb, the reduplications, the frequentatives, the duals); it will appear highly astonishing, to find a uniform tendency in the developement of the understanding, and language among so considerable a portion of the human race.

We have just seen, that the dialect of the Caribbee women, in the West India islands, contained the vestiges of a language that was extinct. What was that language? Of this we are ignorant. Some writers have thought, that it might be that of the Ygneris, or primitive inhabitants of the Caribbee islands; others have perceived in it some resemblance to the ancient idiom of Cuba, or to those of the Aruacas, and the Apalachites in Florida*: but these hypotheses are all founded on a very imperfect knowledge of the idioms, which it has been attempted to compare.

In reading with attention the Spanish authors of the sixteenth century, we see, that the Caribbee nations then extended over eighteen or nineteen degrees of latitude, from the Virgin islands on the east of Portorico to the mouths of the

* *Labat, Voy.*, vol. vi, p. 129. *Rochefort*, p. 326. *Bibl. Univ.*, 1817, p. 355. Is the word *Igneris* (Iyeris?) a corruption of *Eyeris*, which, as we have just seen, signifies *man* in the dialect of the Caribbee women? This employment of the word *man* is very common in ethnographic names.

Amazon. Another prolongation toward the west, along the coast chain of Santa Martha and Venezuela, appears less certain. Gomara, however, and the most ancient historians, give the name of Caribana, not, as it has since been done, to the country between the sources of the Oroonoko and the mountains of French Guyana*, but to the marshy plains between the mouths of the Rio Atrato and the Rio Sinu. I have been on these coasts myself in going from the Havannah to Porto Bello; and I there learned, that the cape, which bounds the gulf of Darien or Uraba on the east, still bears the name of Punta Caribana. An opinion prevailed heretofore pretty generally, that the Caribbees of the West India islands derived their origin, and even their name, from these warlike people of Darien. "Inde Vrabam ab orientali prehendit ora, quam appellant indigenæ Caribana, unde Caribes insulares originem habere nomenque retinere dicuntur." Thus Anghiera†

* The map of Hondius, of 1599, which accompanies the Latin edition of the narrative of Raleigh's voyage. In the Dutch edition (*Nieuwe Caerte van het goudrycke landt Guiana*), the Llanos of Caraccas, between the mountains of Merida and the Rio Pao, bear the name of Caribana. We may remark here, what we observe so often in the history of geography, that the same denomination has spread by degrees from west to east.

† *Petr. Mart., Dec.* 2, *lib.* 1, *p.* 26 *B*, *Dec.* 3, *lib.* 5, p. 54 *A*.

expresses himself in his *Oceaniques*. He had been told by a nephew of Amerigo Vespucci, that thence as far as the snowy mountains of Saint Martha all the natives were " e genere Caribium, vel Canibalium." I do not deny, that real Caribbees may have had a settlement near the gulf of Darien, and that they may have been driven thither by the easterly currents: but it may also have happened, that the Spanish navigators, little attentive to languages, called every people of a tall stature and ferocious character Caribbee and Cannibal. Still it is by no means probable, that the Caribbees of the islands and of Parima imposed on themselves the name of the region, which they had originally inhabited. On the east of the Andes, and wherever civilization has not yet penetrated, it is the people who give the name to the places where they have settled *. We have already had occasion several times to observe, that the words *Caribbees* and *Cannibals* appear significant; that they are epithets, which allude to valour,

* These names of places can be perpetuated only where the nations succeed immediately to each other, and where the tradition is uninterrupted. Thus, in the province of Quito, many of the summits of the Andes bear names, which belong neither to the Quichua (the language of the Inca) nor to the ancient language of the Paruays, governed by the conchocando of Lican.

strength, and even superior intelligence *. It is worthy of remark, that, at the arrival of the Portugueze, the Brazilians designated their magicians by the name of *caraibes* †. We know, that the Caribbees of Parima were the most wandering people of America; perhaps some wily individuals of that nation acted the same part, as the *Chaldeans* of the ancient continent. The names of nations are easily annexed to particular professions; and when, in the time of the Cæsars, the superstitions of the east were introduced into Italy, the *Chaldeans* came as little from the banks of the Euphrates, as our Egyptians or Bohemians (who speak a dialect of India) came from the banks of the Nile or the Elbe.

When the continent and the neighbouring islands are peopled by the same nation, we may choose between two hypotheses; supposing that the emigration has taken place either from the islands to the continent, or from the continent to the islands. The Iberians (Basques), who were settled at the same time in Spain and in the Mediterranean islands‡, afford an instance of this problem; as do also the Malays, who ap-

* Vespucci says: "Charaibi magnæ sapientiæ viri." *Gryn. Nov. Orb.*, p, 145. On the word cannibal, see vol. v, p. 425.

† *Laet*, p. 543.

‡ *Wilhelm von Humboldt, Urbewohner Hispaniens*, p. 167.

pear indigenous in the peninsula of Malacca, and in the district of Menangkabao in the island of Sumatra*. The archipelago of the great and little West India islands forms a narrow neck of land, broken parallel to the isthmus of Panama, and heretofore joining the peninsula of Florida to the north-east extremity of South America. It is the eastern shore of an inland sea, which may be considered as a basin with several outlets. This singular configuration of the land has served to support the different systems of migration, by which it has been attempted to explain the settlement of the nations of the Caribbean race in the islands, and on the neighbouring continent. The Caribbees of the continent admit, that the little West India islands were anciently inhabited by the Aruacas†, a warlike nation, the great body of which is still found on the shores of Surinam and Berbice. They assert, that the Aruacas, with the exception of the women, were all exterminated by some Caribbees, who came from the mouths of the Oroonoko. They cite, in support of this

* Crawfurd, Ind. Archipel., vol. ii, p. 371. I make use of the word indigenous, *autocthoni*, not to point out a fact of *creation*, which does not belong to history; but simply to indicate, that we are ignorant of the *autocthoni* having been preceded by any other people.

† *Arouaques*. The missionary Quandt (*Nachricht von Surinam*, 1807, p. 47) calls them *Arawackes*.

tradition, the traces of analogy, which are observed between the language of the Aruacas and that of the Caribbee women; but we must recollect, that the Aruacas, although the enemies of the Caribbees, belonged to the same branch of people; and that the same similitude exists between the Aruack and Caribbee languages, as between the Greek and the Persian, the German and the Sanscrit. According to another tradition, the Caribbees of the islands came from the south, not as conquerors, but on being expelled from Guyana by the Aruacas, who ruled originally over all the neighbouring nations. Finally, a third tradition *, which is much more general and more probable, makes the Caribbees arrive from North America, and indeed from Florida. A traveller, who has collected whatever relates to these migrations from north to south, Mr. Bristock, asserts, that a tribe of Confachites (Confachiqui) had long warred with the Apalachites; that the latter, having yielded to that tribe the fertile district of Amana, called their new confederates Caribbes (that is *valiant strangers*); but that, in

* The province of Confachiqui, subject in 1541 to a woman, is become celebrated by the expedition of Hernando de Soto to Florida. (*Her. Dec.* 7, p. 21.) Among the nations of the Huron tongue, and the Attakapas, the supreme authority was also often confided to women. *Charlevoix*, vol. v, p. 397; *Filson*, p. 185.)

consequence of an altercation on their religious rites, the Confachite-Caribbees were driven from Florida. They went first to the Yucayas or Lucayes islands (to Cigateo and the neighbouring islands); thence to Ayay (Hayhay, now Santa Cruz), and to the little Caribbee islands; and lastly to the continent of South America *. It is believed, that this event took place toward the year 1100 of our æra; but in this estimation it is supposed, as in certain fables of the east, "that the sobriety and innocent manners of savages" augment the mean term of a generation to one hundred and eighty or two hundred years, which renders the indication of a fixed epoch altogether imaginary. In the course of this long migration, the Caribbees had not touched at the larger islands; the inhabitants of which however, believed also, that they came originally from Florida †. The islanders of Cuba, Haïti, and Boriken (Portorico), were, according to the uniform testimony of the first *conquistadores*, entirely different from the Caribbees; and at the period of the discovery of

* *Rochefort, Hist. des Antilles,* vol. i, p. 326—353; *Garcia,* p. 322; *Robertson,* Book iii, note 69. The conjecture of father Gili, that the Caribbees of the continent may have come from the islands at the time of the first conquest of the Spaniards (*Saggio,* vol. iii, p. 204), is contrary to all that the first historians relate.

† *Herera, Dec.* 1, p. 235; *Dec.* 2, p. 163.

America, the latter had already abandoned the group of the little Lucayes islands; an archipelago, in which an astonishing variety of languages prevailed, as always happens in lands peopled by shipwrecks, and by fugitives *.

The dominion, which the Caribbees so long exercised over a great part of the continent, and the remembrance of their ancient greatness, have inspired them with a sentiment of dignity and national superiority, which displays itself in their manners and their discourse. "We alone are a nation," say they proverbially; "the rest of mankind (*oquili*) are made to serve us." This contempt of the Caribbees for their ancient enemies is so strong, that I saw a child often years of age foam with rage on being called a *Cabre* or *Cavere*; though he had never in his life seen an individual of this unfortunate people †, who gave their name to the town of Cabruta (Cabritu); and who, after a long resistance, were almost entirely exterminated by the Caribbees. Thus we find among half savage hordes, as in the most civilized part of Europe, those inveterate animosities, which have caused the names of nations, that are enemies, to pass

* "La gente de las islas Yucayas era (1492) mas blanca y de major policia que la de Cuba y Haiti. Havia mucha diversidad de lenguas." *Gomara, Hist. de Ind.*, fol. xxi.

† See above, vol. v, p. 151, 204, 209, and 681.

into their respective languages as appellations the most opprobrious.

The missionary led us into several Indian huts, where an extreme neatness and order prevailed. We saw with pain the torments, which the Caribbee mothers inflict on their infants, in order not only to enlarge the calf of the leg, but to raise the flesh in alternate stripes from the ankle to the top of the thighs. Bands of leather, or of woven cotton, are placed like narrow ligatures at two or three inches distant; and being tightened more and more, the muscles between the bands become swelled. Our infants when swaddled suffer much less than these Caribbee children, in a nation which is said to be so much nearer a state of nature. In vain the monks of the missions, without knowing the works or the name of Rousseau, attempt to oppose this ancient system of physical education. Man when just issued from the woods, and who is thought to be so simple in his manners, is far from being docile with respect to his ornaments, and the ideas which he has formed of beauty and propriety. I observed however with surprise, that the manner in which these poor children are bound, and which seems to obstruct the circulation of the blood, does not weaken their muscular movements. There is no race of men more robust, and swifter in running, than the Caribbees.

If the women labour to form the legs and thighs of their children so as to produce what the painters call undulating outlines, they abstain, at least in the Llanos, from flattening the head, by compressing it between cushions and planks from the most tender age. This usage, so common heretofore in the islands, and among several tribes of the Caribbees of Parima and French Guyana, is not practised in the missions which we visited. The men there leave the forehead rounder than the Chaymas, the Otomacks, the Macoes, the Maravitans, and the greater part of the inhabitants of the Oroonoko. A systematizer would say, that it is such as the intellectual faculties require. We were so much the more struck by this observation, as the skulls of Caribbees engraved in Europe*, in some works of anatomy, are distinguished from all other human skulls by the most depressed forehead, and the most acute facial angle. But in osteological collections the productions of art have been confounded with the state of nature. What are shown as the skulls of Caribbees of the island of Saint Vincent, "almost destitute of forehead," are skulls shaped between planks, and belonging to Zamboes (*black Carib-*

* I shall only mention as an example a plate drawn by the illustrious anatomist Peter Camper: *Viri adulti cranium ex Caraibensium insula Sancti-Vicentii in Museo Clinii asservat*, 1785.

bees), who are descended from Negroes and true Caribbees *. The barbarous habit of flattening the forehead is found among several nations †, that are not of the same race; and has been observed recently as far as in North America; but nothing is more vague than the conclusion, that some conformity of customs and manners proves an identity of origin. The traveller, who observes the spirit of order and submission, that prevails in the Caribbee missions, can scarcely

* These unhappy remains of a people heretofore powerful were banished, in 1795, to the island of Rattam, in the bay of Honduras, because they were accused by the English government of having connexions with the French. An able minister, Mr. Lescallier, had proposed (1760) to the court of Versailles, to invite the *red and black Caribbees* from Saint Vincent to Guyana, and employ them as free men in the cultivation of the land. I doubt if their number at that period amounted to six thousand; the island of Saint Vincent containing in 1787 not more than fourteen thousand inhabitants of all colours. (*Lescallier, sur la Guyane francaise*, p. 47.)

† For instance, the Tapoyranas of Guyana (*Barrere*, p. 239), the Solkeeks of Upper Louisiana (*Walckenaer, Cosmogr.*, p. 583). "Los Indios de Cumana," says Gomara (*Hist. de Ind.*, fol. xlv), "aprietan a los niños la cabeça muy blando, pero mucho, entre dos almohadillas de algodon para ensanchar los la cara, que lo tienen por hermosura. Las donzellas van de todo punto desnudas. Traen senogiles muy apretados por debaxo y encima de las rodillas, para que los muslos y pantorillas engorden mucho. Dan las novias á los piaches, hombres sanctos y religiosos. Los reverendos padres toman aquel trabajo y los novios se quitan de sospecha, quexa y pena."

persuade himself, that he is among cannibals. This American word, of a somewhat doubtful signification, is probably derived from the language of Haïti, or that of Portorico; it has passed into the languages of Europe, since the end of the fifteenth century, as synonimous with that of anthropophagi. Edaces humanarum carnium novi heluones anthropophagi, Caribes alias Canibales appellati," says Anghiera, in the third decade of his *Oceanics* *, dedicated to pope Leo the tenth. I have little doubt, that the Caribbees of the islands, when a conquering people, exercised cruelties toward the Ygneris, or ancient inhabitants of the West Indies, who were weak, and little warlike; but we must also admit, that these cruelties were exaggerated by the first travellers, who heard only the narratives of nations that were the ancient enemies of the Caribbees. It is not always the vanquished solely, who are calumniated by their contemporaries; the insolence of the conquerors is avenged also by augmenting the list of their crimes.

We were assured by all the missionaries of the Carony, the Lower Oroonoko, and the *Llanos del Cari*, whom we had an opportunity of consulting, that the Caribbees are perhaps the least anthropophagous nations of the New Conti-

* *Dec.* 3, *lib.* 3, p. 49, B.

nent. They extend this assertion event to the independant hordes who wander on the east of the Esmeralda, between the sources of the Rio Branco and the Essequibo. We may conceive, that the fury and despair, with which the unhappy Caribbees defended themselves against the Spaniards, when in 1504 a royal decree* declared them slaves, may have contributed to the reputation they have acquired of ferocity. The first idea of attacking this nation, and depriving it of liberty and of it's natural rights, is owing to Christopher Columbus†, who, being a man of the fifteenth century, was not always so humane, as he is said to be in the eighteenth from hatred of his detractors. Subsequently the licenciado Rodrigo de Figueroa was appointed by the court in 1520, to decide which of the tribes of South America might be regarded as of Caribbee race, or as *cannibals*; and which were *Guatiaos*‡, that is, Indians of peace, and

* "Dati erant in prædam Caribes ex diplomate regio. Missus est Johannes Poncius qui Caribum terras depopuletur et in servitutem obscœnos hominum voratores redigat." *Petr. Mart. Ocean., Dec.* 1, lib. p. 26, A; te *Dec.* 3, lib. vi, p. 57, C. Gomara, *Hist. de Ind.* fol. cxxix.

† *Pedro Muñoz, Hist. del Nuevo Mondo*, p. 199.

‡ I had some trouble in discovering the origin of this denomination, become so important from the fatal decrees of Figueroa. The Spanish historians often employ the word *guatiao* to designate a branch of nations. "La isla Margarita entre las islas de Caribes y de Indios *Guatiaos*, amigos

friends of the Castilians. That ethnographic piece, called *el auto de Figueroa*, is one of the most curious records of the barbarism of the first *conquistadores*. Never had the spirit of system served more effectually to flatter the passions. Our geographers do not distinguish more arbitrarily in central Asia the Mongul from the Tatar nations, than Figueroa traced the limit between the cannibals and the *Guatiaos*. Without any attention to the analogy of languages, every nation, that could be accused of having devoured a prisoner after a battle,

de los Castellanos, que estan mas adelante de la isla Española. En lo mas arriba de la costa de Tierra firme havia una provincia que se decia Parucuria, la qual era de *Guatiaos* que no son Caribes." *Herera, Dec.* 2, p. 258; *Dec.* 3, p. 210. Becoming a *guatiao* of any one appears to me, to have signified in the language of Haïti concluding a treaty of friendship. In the West India Islands, as well as in the archipelago of the South Sea, names were exchanged as a token of alliance. "Juan de Esquivel (1502) se hice *Guatiao* de Cacique Cotubanama; el qual desde adelante se llamó Juan de Esquivèl, porque era liga de perpetua amistad entre los Indios trocarse los nombres: *y trocados quedaban Guatiaos*, que era tanto como confederados y hermanos en armas. Ponce de Leon se hice *Guatiao* con el poderoso Cacique Agueinaha." *Herera, Dec.* 1, p. 129, 159, 181. One of the Lucayes islands, inhabited by a mild and pacific people, was heretofore called *Guatao* (Laet, p. 20); but we will not insist on the etymology of this word, because, as was observed above, the languages of the Lucayes islands differed from those of Haïti.

was arbitrarily declared of Caribbee race. The inhabitants of Uriapari (of the peninsula of Paria) were named Caribbees; the Urinacoes (settled on the banks of the Lower Oroonoko, or Urinucu), Guatiaos. All the tribes designated by Figueroa as Caribbees were condemned to slavery; and might at will be sold, or exterminated by war. In these bloody struggles, the Caribbee women, after the death of their husbands, defended themselves with such desperation, that, Anghiera says*, they were taken for tribes of Amazons. The odious declamations of a Dominican monk (Thomas Hortiz) contributed to prolong the misfortunes, that weighed on whole nations. However, amid the cruelties exercised toward the Caribbees, it is consoling to find, that there existed some courageous men, who caused the voice of humanity and justice to be heard. Some of the monks embraced an opinion different from that which they had at first adopted†. In an age when there could be no hopes of founding public liberty on civil institutions, an attempt was made to defend at least individual liberty. "That is a law most holy (*ley sanctissima*)," says Gomara, in 1551, "by which our emperor has prohibited the reducing of the Indians to slavery. It is just,

* *Ocean., Dec.* 3, *lib.* ix, p. 63, D. See also above, vol. v, p. 394.

† *Gomara, Hist. de Ind.*, fol. xix.

that men, who are all born free, should not become the slaves of one another."

We observed with surprise, during our abode in the Caribbee missions, the facility with which young Indians of eighteen or twenty years of age, when raised to the employment of *alguacil*, or *fiscal*, harangued the municipality for whole hours. Their enunciation, the gravity of their deportment, the gestures which accompanied their speech, all denoted an intelligent people capable of a high degree of civilization. A Franciscan monk, who knew enough of the Caribbee language to preach in it occasionally, made us notice in the discourses of the Indians, how long and harmonious the periods were, without ever being confused or obscure. Particular inflexions of the verb indicate previously the nature of the object, whether it be animate or inanimate, one or many. Little annexed forms (*suffixa*) mark the gradations of sentiment; and here, as in every language formed by an unshackled development, the clearness arises from that regulating instinct *, which characterises human intelligence in the various states of barbarism and cultivation. The whole

* *William von Humboldt*, on the comparative Study of Languages, and the different Epochs of their Development, 1821 (in German), p. 13. See also, vol. iii, p. 272; and vol. v, p. 295.

village assembles on holidays before the church, after the celebration of mass. The young girls place at the feet of the missionary faggots of wood, bunches of plantains, and other provision of which he stands in need for his household. At the same time the *governador*, the *fiscal*, and other municipal officers, all of whom are Indians, exhort the natives to labour, proclaim the occupations of the ensuing week, reprimand the idle, and, since it must be told, severely cudgel the untractable. The strokes of the cane are received with the same insensibility with which they are given. These acts of distributive justice appear very long and frequent to travellers, who cross the Llanos in their way from Angostura to the coasts. It were to be wished, that the priest did not dictate these corporal punishments at the instant of quitting the altar, and that he were not in his sacerdotal habits the spectator of this chastisement of men and women; but this abuse, or, if the reader prefer the term, this want of propriety, arises from the principle on which the strange government of the missions is founded. The most arbitrary civil power is strictly connected with the rights, which the priest exerts over the little community; and, although the Caribbees are not *cannibals*, and we would wish to see them treated with mildness and indulgence, it may be conceived, that energetic measures are some-

times necessary, to maintain tranquillity in this rising society.

The difficulty of fixing the Caribbees to the soil is so much the greater, as they have been for ages in the habit of trading on the rivers. We have described above this active people, at once commercial and warlike, occupied in the traffic of slaves, and carrying merchandize from the coasts of Dutch Guyana to the basin of the Amazon. The travelling Caribbees were the Bukharians of equinoctial America; accordingly the necessity of counting the objects of their little trade, and transmitting intelligence, had led them to extend and improve the use of the *quippoes*, or, as they call them in the missions, the *cordoncillos con nudos* *. These *quippoes* or knots are found in Canada †, in Mexico (where Boturini procured some from the Tlascaltecks), in Peru, in the plains of Guyana, in central Asia, in China, and in India. As rosaries, they are become objects of devotion in the hands of the Christians of the east; as *swanpans*, they have been employed in the operations of manual or *palpable arithmetic* by the Chinese, the Tatars, and the Russians ‡. The independant Ca-

* Vol. v, p. 360.

† *Caulin*, p. 333.

‡ *Views of the Cordilleras, and American Monuments*, vol. i, p. 168; ii, p. 146. On the *quippoes* found at the Oroono-ko, among the Tamanacks, see *Gilt*, vol. ii, p. . The

ribbees, who inhabit the country so little known between the sources of the Oroonoko, and those of the rivers Essequibo, Carony, and Parima*, are divided into tribes; and, like the nations of the Missouri, Chili, and ancient Germany, form a political confederation. This system is the most suitable to the spirit of liberty, which prevails in those warlike hordes, who see no advantage in the ties of society but for common defence. The pride of the Caribbees leads them to withdraw themselves from every other tribe;

quippoes of strings of the nations of Upper Louisiana are called *wampum*. (*John Filson*, Hist. of Kentucky, p. 102; *Charlevoix, Hist. de la Nouv. France*, vol. v, p. 308; *Lepage de Pratz, Hist. de la Louisiana*, vol. ii, p. 196.) Anghiera relates (*Ocean., Dec.* 3, *lib.* 10, p. 65, D.) a very curious fact, which seems to prove, that the travelling Caribbees had some idea of bound books, like those of the Mexicans and our own. I have elsewhere made known (Views of the Cordilleras, vol. i, p. 174.) the curious discovery of rolls of paintings found on the banks of the Ucayale, among the Panoes. The Peruvians had also, beside the *quippoes*, hieroglyphical paintings similar to those of Mexico, but ruder. (*Garcia, Origen de los Indios*, p. 91.) Since the conquest painted pages have been used by them for confession. Perhaps the fugitive Caribbee, who came to Darien from the inland country, and of whom Anghiera makes mention, had had an opportunity of seeing at Quito, or at Cundinamarca, some Peruvian book. I employ, like the first Spanish travellers, the word *book*, since it by no means presumes the use of alphabetical writing.

* Rio Branco, or Rio de Aguas Blancas.

even from those, to whom from their language they have some relation.

They claim the same separation in the missions; which seldom prosper, when any attempt is made, to associate them with other mixed communities, that is with villages, where every hut is inhabited by a family belonging to another nation, and speaking another idiom. The chiefs of the independant Caribbees are hereditary in the male line only, the children of sisters being excluded from the succession. This is founded on a system of mistrust, which denotes no great purity of manners; it is the custom of India, of the Ashantees (in Africa), and among several tribes* of the

* Among the Hurons (Wiandots) and the Natchez, the succession to the magistracy is continued by the women: it is not the son who succeeds, but the son of the sister, or of the nearest relation in the female line. This mode of succession is said to be the most certain, because the supreme power remains attached to the blood of the last chief; it is a practice that ensures legitimacy. (Filson, p. 183.) I have found ancient traces of this strange mode of succession, so common in Africa and in the East Indies, in the dynasty of the kings of the West India islands. "In testamentis autem quam fatue sese habeant intelligamus: ex sorore prima primogenitum, si insit, relinquunt regnorum hæredem; sin minus, ex altera, vel tertia, si ex secunda proles desit: quia a suo sanguine creatam sobolem eam certum est. Filios autem uxorum suarum pro non legitimis habent. Uxores ducunt quotquot placet. Ex uxoribus chariores cum regulo sepeliri patiuntur." *Petr. Mart. Ocean., Dec.* 3, *lib.* ix, p. 63, B.

savages of North America. The young chiefs, like the youths who are desirous of marrying, are subjected to the most extraordinary fasts and penances. They are purged with the fruit of some of the euphorbiaceæ; are sweated in stoves; and take medicines prepared by the *marirris* or *Piaches*, which are called in the transalleghanian countries *war-physick*. The Caribbee *marirris* are the most celebrated of all: at once priests, jugglers, and physicians, they transmit to their successors their doctrine, their artifices, and the remedies they employ. The latter are accompanied with laying on of hands, and certain gestures and mysterious practices, which appear to be connected with the most anciently known processes of animal magnetism. Although I had opportunities of seeing many persons, who had closely observed the confederated Caribbees, I could not learn whether the *marirris* belong to a particular cast. It is observed in North America, that, among the Shawanese*, divided into several tribes, the priests, who preside at the sacrifices, must be (as among the Hebrews) of one particular tribe, that of the Mequachakes. Whatever may be hereafter discovered in America respecting a

* People that came from Florida, or from the South (*shawaneu*), toward the North. (*Archæol. Amer.*, vol. i, p. 275; Histor. Trans. of Phil., vol. i, p. 28, 69, 77, 83).

sacerdotal cast appears to me calculated to excite great interest, on account of those priest-kings of Peru, who called themselves the children of the Sun; and of those *sun-kings* among the Natchez, who involuntarily recall to mind the Heliades of the first eastern colony of Rhodes *. In order to study thoroughly the manners and customs of the great Caribbee nation, it is requisite to visit the missions of the Llanos, those of the Carony, and the savannahs that extend to the South of the mountains of Pacaraymo. The more we learn to know them, say the monks of Saint Francis, the more we lose the prejudices, which prevail against them in Europe, as being more savage, or, to use the simple expression of a lord of Montmartin, as being less *liberal* than the other tribes of Guyana †. The language of the Caribbees of the Continent is the same from the sources of Rio Branco to the steppes of Cumana. I was fortunate enough to procure a manuscript, containing an extract, made by father Sebastian Garcia, of the *Gramatica de la lengua Caribe del P. Fernando Ximenes*. This valuable manuscript has been used in the researches made by

* *Diod.* lib. v, § 56; *Clavier*, vol. i, p. 283.

† "The Caribbees are tall and plump; but are little disposed to be liberal, for they like to feed on human flesh, lizards, and crocodiles." (*Descript. gén. de l'Amérique par Pierre d'Avity, Seigneur de Montmartin*, 1660, p. 118.)

Mr. Vater *, and lately on a more comprehensive plan by my brother, Mr. William de Humboldt, on the structure of the American languages.

On quitting the mission of Cari, we had some difficulties to settle with our Indian muleteers. They had perceived to our great astonishment, that we had brought skeletons with us from the cavern of Ataruipe †; and they were firmly persuaded, that the beasts of burden, which carried "the bodies of their old relations," would perish in the journey. Every precaution we had taken had been useless; nothing escapes the penetration and the sense of smell of a Caribbee, and it required all the authority of the missionary, to forward our baggage. We had to cross the Rio Cari in a boat, and the *Rio de agua clara*, by fording, I might almost say by swimming. The quicksands of the bed of this river render the passage very difficult at the season when the waters are high. The strength of the currents seems surprising in so flat a country; but the rivers of the steppes are precipitated, to use a fine expression of Pliny the younger ‡, "less by the declivity of their

* *Mithridates*, vol. iii, p. 685. Father Gili had no knowledge of this manuscript. *Saggio*, vol. iii, p. 410.

† See above, vol. v, p. 615—23.

‡ *Epist., lib.* viii, ep. 8. "Clitumnus non loci devexitate, sed ipsa sui copia et quasi pondere impellitur."

course, than by their abundance, and as it were by "their own weight." We had two bad stations, at Matagorda and at Los Riecetos, before we reached the little town of Pao. We met every where with the same objects; small huts constructed of reeds, and roofed with leather; men on horseback armed with lances guarding the herds; herds of cattle half wild, remarkable for their uniform colour, and disputing the pasturage with the horses and mules. No sheep or goats are found on these immense steppes! Sheep do not breed kindly in equinoctial America, except on the table-lands above a thousand toises high, where their fleece is long, and sometimes very fine. In the ardent climate of the plains, where the wolves give place to jaguars, these small ruminating animals, destitute of means of defence, and so slow in their movements, are unable to preserve themselves in great numbers.

We arrived on the 15th of July at the *Fundacion* or Villa del Pao, founded in 1744, and placed very favourably to serve as a commercial station between Nueva Barcelona and Angostura. It's real name is *el Concepcion del Pao.* Alcedo, La Cruz Olmedilla, and many other geographers, have mistaken it's situation; confounding this small town of the Llanos of Barcelona either with San Juan Bauptisto del Pao of the Llanos of Caraccas, or with El Valle del Pao de Za-

rate *. Though the weather was cloudy, I succeeded in obtaining some heights of α Centauri, serving to determine the latitude of the place; which is 8° 37′ 57″. Some altitudes of the Sun gave me 67° 8′ 12″ for the longitude, supposing Angostura to be 66° 15′ 21″. The astronomical determinations of Calabozo † and Concepcion del Pao are sufficiently important to the geography of this country, where, in the midst of savannahs, fixed points are altogether wanting. Some fruit-trees grow in the vicinity of Pao, which is a rare circumstance in the steppes. We even found some cocoa trees, that appeared very vigorous, notwithstanding the great distance of the sea. I lay some stress on this last observation, because doubts have recently been started respecting the veracity of travellers, who assert, that they saw the cocoa tree, which is a *palm of the shore*, at Tombuctoo, in the centre of Africa ‡. It happened to us several times, to see cocoa trees amid the cultivated spots on the banks of the Rio Magdalena, more than a hundred leagues from the coast.

Five days, which to us appeared very tedious, brought us from Villa del Pao to the port of

* Caulin, p. 843. Depons, vol. iii, p. 209.

† See above, vol. iv, p. 377.

‡ According to the report of the sailor Adams, and that of Hadjee Talub Ben Jelow, in Fitzclarence's Route across India, p. 494.

Nueva Barcelona. As we advanced, the sky became more serene, the soil more dusty, and the atmosphere more fiery. The heat, from which we suffered, is not entirely owing to the temperature of the air, but is produced by the fine sand mingled with it, that darts in every direction, and strikes against the face of the traveller, as it does against the ball of the thermometer. I never observed however the mercury rise in America, amid a *wind of sand*, above 45·6° cent. - Captain Lyon, with whom I had the pleasure of an interview on his return from Mourzouk, appeared to me also inclined to think, that the temperature of fifty-two degrees, which is so often felt in Fezzan, is produced in great part by the grains of quartz suspended in the atmosphere. Between Pao, and the village of Santa Cruz de Cachipo, founded in 1749, and inhabited by five hundred Caribbees *, we passed the western elongation of the little table-land, known by the name of Mesa de Amana. This table-land forms a point of partition between the Oroonoko, the Guarapiche, and the coast of New Andalusia. It's height is so inconsiderable, that it would scarcely be an obstacle to the establishment of an inland navigation in this part of the Llanos. The Rio Mano however,

* The population, in 1754, was only one hundred and twenty souls. *Caulin*, p. 352.

which flows into the Oroonoko above the confluence of the Carony, and which D'Anville (I know not on what authority) has marked in the first edition of his great map as issuing from the lake of Valencia, and receiving the waters of the Guayra, could never have served as a natural canal between two basins of rivers. No bifurcation of this kind exists in the steppe. A great number of Caribbee Indians, who now inhabit the missions of Piritoo, were settled formerly at the north and east of the table-land of Amana, between Maturin, the mouth of the Rio Arco, and the Guarapiche; it was by the incursions of don Joseph Careno, one of the most enterprising governors of the province of Cumana, that a general migration of independant Caribbees toward the banks of the Lower Oroonoko in 1720 was occasioned.

The whole of this vast plain consists, as we have shown above *, of secondary formations; which toward the South rest immediately on the granitic mountains of the Oroonoko. Toward the north-west they are separated by a narrow band of *transition rocks* † from the primitive mountains of the shore of Caraccas. This abundance of secondary rocks, which cover without interruption a space of more than seven thou-

* Vol iv, p. 384—7.

† Vol. iv, p. 279—82.

sand square leagues (reckoning only that part of the *llanos*, which is bounded by the Rio Apure on the South, and by the Sierra Nevada de Merida and the Paramo de las Rosas on the West), is a phenomenon so much the more remarkable in that region of the globe, because in the whole of the Sierra de la Parima, between the right bank of the Oroonoko and the Rio Negro, there is, as in Scandinavia, a total absence of secondary formations. The *red sandstone*, containing some vestiges of fossil wood (of the family of monocotyledons), is seen every where in the steppes of Calabozo; farther East it is overlaid by calcareous and gypseous rocks, which conceal it from the research of the geologist. The marly gypsum, of which we collected specimens near the Caribbee mission of Cachipo, appeared to me to belong to the same formation as the gypsum of Ortiz. To class it according to the type of European formations, I would range it among the gypsums, often muriatiferous, that cover the Alpine limestone, or *zechstein*. Farther North, toward the mission of San Josef de Curataquiche, Mr. Bonpland picked up in the plain some fine pieces of ribband jasper, or *Egyptian pebbles*. We did not see them in their native place enchased in the rock; and are ignorant whether they belong to a very recent conglomerate, or to that limestone which we saw at the Morro of New Barcelona, and

which is not transition limestone, though it contains beds of schistous jasper (*kieselschiefer*).

It is impossible to cross the steppes or savannahs of South America, without indulging the hope, that science will one day profit from the many advantages they offer, above any other region of the Globe, for measuring the degrees of a terrestrial arch in the direction of a meridian, or perpendicularly to the meridian. Their great extent from east to west would render the measurement of some degrees of longitude extremely easy; and this operation would be very interesting with respect to the precise knowledge of the figure of the Earth. The *llanos* of Venezuela are thirteen degrees east of the places, where, on the one side, the French academicians, by triangles resting on the summits of the Cordilleras, and on the other, Mason and Dixon, renouncing (in the plains of Pennsylvania) the aid of trigonometry, executed their measurements; and they are nearly on the same parallel, which is a very important circumstance, as the table-land of India, between the Jumna and Madura, which was the theatre of Colonel Lambton's excellent operations. Whatever doubts may yet be entertained concerning the precision of instruments, the errors of observations, and the influence of local attractions, it would be difficult in the present state of our knowledge, to deny the inequalities of the flat-

tening of the Earth. When a more intimate connexion is established between the free governments of La Plata and Venezuela, advantage will no doubt be taken of the public tranquillity, to execute on the north and south of the equator, in the *llanos* and the *pampas*, the measurements we propose. The *llanos* of Pao and Calabozo are nearly under the same meridian as the *pampas* south of Cordova; and the difference of latitude of these plains, as smooth as if they had been levelled by a long abode of the waters, is forty-five degrees. These geodesic and astronomical observations would cost little, on account of the nature of the places. In 1734 La Condamine* showed how much more useful and expeditious it would have been, to have sent the academicians into the plains (perhaps somewhat too woody and marshy), that extend on the south of Cayenne toward the confluence of the Rio Xingu and Amazon, than to have compelled them to struggle, on the table-land of Quito, with cold, with tempests, and with the eruptions of volcanoes.

The Spanish American governments ought not to consider the projected operations in the

* *Voy., à l'Equat.*, p. 194 and 201. If we were to seek for a country entirely flat and open, *under the equator itself*, I should prefer the plains extending south of the chain of the mountains of Pacaraymo, toward the mouth of the Rio Branco, to those which have been noted by M. de la Condamine. See above, vol. v, p. 789 and 861.

llanos, combined with the observations of the pendulum, as interesting to science alone; they are at the same time the principal bases of maps, without which any regular administration of the affairs of a country is impossible. Hitherto this has been necessarily limited to a simple astronomical sketch; this being the surest and most ready means on a surface of large extent. Attempts have been made, to determine the longitude of certain points on the coast and in the interior in an *absolute* manner; that is, by celestial phenomena, or series of lunar distances. The most important places have been fixed according to the three coördinates of latitude, longitude, and height. The intermediate points have been deduced *chronometrically* from the principal points. The very uniform movement of the chronometers in the boats, and the strange inflexions of the Oroónoko, have facilitated this connection. By bringing the chronometers to the point of departure; or by observing twice, going and coming, at an intermediary point, joining the extremities of the *chronometric lines** at two places very distant from each

* I mean by this expression, perhaps improper, the lines that unite points, the longitude of which has been determined by means of the chronometer, and which are consequently dependant on one another. It is on the proper disposition of these lines, that the precision of a measurement merely astronomical depends.

other, and the position of which is founded on absolute or simply astronomical phenomena; we are capable of estimating the sum of the errors that may have been committed. It was thus (and no determination of longitude had been made before me in the interiour) that I connected astronomically Cumana, Angostura, Esmeralda, San Carlos del Rio Negro, the Great Cataracts, San Fernando de Apure, Portocabello, and Caraccas. These determinations contain within just limits an *area* of more than ten thousand square leagues. The system of the positions on the shore, and the valuable results of the plans executed by the maritime expedition of Fidalgo, have been joined to the system of the positions on the Oroonoko and the Rio Negro by two chronometric lines, one of which crosses the *llanos* of Calabozo, and the other the *llanos* of Pao. The observations on the Parima present a band, that divides into two parts an immense extent of land (seventy-three thousand square leagues) of various kinds, not one point of which had till then been astronomically determined *. These labours, which I undertook with feeble means, but according to a general plan, have furnished, I venture to flatter myself, the first astronomical basis of the geography of those countries; but it is time to multiply them, to improve them,

* See above, vol. v, p. 788, note †.

and above all to substitute for them, where the cultivation of the country permits, trigonometric operations. On the two borders of the llanos, that extend like a gulf from the delta of the Oroonoko to the snowy mountains of Merida, two granitic chains, toward the north and toward the south, stretch parallel to the equator. These ancient coasts of an interior basin are visible from afar in the steppes, and might serve to establish signals. The Peak of Guacharo, Cocollar, and Tumiriquiri, the Bergantin, the Morros of San Juan and San Sebastian, the Galera, that bounds the *llanos* like a rocky wall, the little Cerro de Flores which I saw at Calabozo, and this at a moment when the *mirage* was almost null, will serve for the series of triangles toward the northern limit of the plains. A great part of these summits is visible at the same time in the *llanos*, and in the cultivated stripe of the coast. Toward the south the granitic chains of the Oroonoko or the Parima are a little distant from the borders of the steppe, and less favorable to geodesic operations. The mountains however, that rise above Angostura and Muitaco, the Cerro del Tirano near Caycara, the Pan de Azucar, and Sacuima near the confluence of the Apure and the Oroonoko, may be very useful; especially if the angles be taken in cloudy weather, so that the play of extraordinary refractions over a soil strongly

heated may not disfigure or displace the summits of mountains seen under angles of too little altitude. Signals by firing gunpowder, the reflection of which toward the sky is distinguished at such a distance, will be of considerable assistance. I thought it might be useful to mention in this place what I had derived from my knowledge of the localities, and my study of the geography of America. Mr. Lanz, a distinguished geometrician, who unites with an extensive knowledge of every branch of mathematics the practical use of astronomical instruments, is at present employed in improving the geography of those countries; and in executing, under the auspices of the free government of Venezuela, a part of the projects, to which in the year 1799 I in vain called the attention of the Spanish ministry.

We rested on the night of the 16th of July in the Indian village of Santa Cruz de Cachipo. This mission was founded in 1749 by the union of several Caribbee families; who inhabited the inundated and unhealthy banks of the *Lagunetas de Auache,* opposite the confluence of the Zir Puruay with the Oroonoko. We lodged at the house of the missionary*; and, on examining the registers of the parish, we saw how rapid a progress the prosperity of the community

* Fray Jose de las Piedras.

had made, owing to his zeal and intelligence. Since we had reached the middle of the steppes, the heat had increased to such a degree, that we should have preferred travelling no more during the day; but we were without arms, and the *llanos* were then infested by an immense number of robbers, who assassinated the whites that fell into their hands with an atrocious refinement of cruelty. Nothing is more deplorable than the administration of justice in the colonies beyond sea. We every where found the prisons filled with malefactors, on whom sentence is not passed till after waiting seven or eight years. Nearly a third of the prisoners succeed in making their escape; and the unpeopled plains, filled with herds, afford them both an asylum and food. They commit their depredations on horseback, in the manner of the Bedoweens. The insalubrity of the prisons would be at it's height, if they were not emptied from time to time by the flight of the prisoners. It often happens also, that sentences of death, tardily pronounced by the *audiencia* of Caraccas, cannot be executed for want of a hangman. In these cases a barbarous custom prevails, which I have already mentioned, of pardoning one criminal on the condition of his hanging the others. Our guides related to us, that a short time before our arrival on the coast of Cumana, a Zambo, known for the great ferocity of his

manners, determined to screen himself from punishment by becoming the executioner. The preparations for the execution however shook his resolution; he felt a horror of himself, and, preferring death to the disgrace of thus saving his life, called again for his irons, which had been struck off. He did not long suffer detention, and underwent his sentence by the baseness of one of his accomplices. This awakening of a sentiment of honour in the soul of a murderer is a psychologic phenomenon worthy of reflection. The man, who had so often shed blood when stripping the traveller in the steppe, recoiled at the idea of becoming the passive instrument of justice, to inflict upon others a punishment, which he felt perhaps he himself deserved.

If, in the peaceful times when Mr. Bonpland and myself had the good fortune to travel through both Americas, the *llanos* were even then the refuge of malefactors, who had committed crimes in the missions of the Oroonoko, or who had escaped from the prisons on the coast, how much worse must this state of things have become in consequence of civil discords, and amid that sanguinary struggle, which has terminated by giving liberty and independance to those vast regions! Our wastes and heaths are but a feeble image of the savannahs of the New Continent, which for the space of eight or ten thousand square leagues are smooth as the

surface of the sea. The immensity of their extent insures impunity to vagabonds; for they are better concealed in the savannahs than in our mountains and forests; and it is easy to conceive, that the artifices of a European police could not be easily put in practice, where there are travellers and no roads, herds and no herdsmen, and farms so solitary, that, notwithstanding the powerful action of the *mirage*, several days' journey may be made without seeing one appear within the horizon.

In traversing the *llanos* of Caraccas, Barcelona, and Cumana, which succeed each other from west to east, from the snowy mountains of Merida to the Delta of the Oroonoko, we ask ourselves, whether these vast tracts of land be destined by Nature to serve eternally for pasture, or the plough and the spade of the labourer will one day subject them to cultivation. This question is so much the more important, as the *llanos*, placed at the two extremities of South America, are obstacles to the political union of the provinces they separate. They prevent the agriculture of the coast of Venezuela from extending toward Guyana, and that of Potosi toward the mouth of the Rio de la Plata. The interposed steppes preserve with the pastoral life something rude and wild, which separates and keeps them remote from the civilization of countries anciently cultivated.

It is for the same reason, that in the war of independance, they have been the theatre of the struggle between the hostile parties, and that the inhabitants of Calabozo have almost seen the fate of the confederated provinces of Venezuela and Cundinamarca decided under their walls. I could wish, that in assigning limits to the new states, and to their subdivisions, there may be found no cause to repent *hereafter* having lost sight of the importance of the *llanos*, and the influence they may have on the disunion of communities, which important common interests should bring together. The steppes would serve for natural limits, like the seas, or the virgin forests of the tropics, if armies could not cross them with a facility so much the greater, as they furnish in their innumerable troops of horses and mules, and herds of oxen, all the means of conveyance and subsistence.

In no other part of the world are the configuration of the ground and the state of it's surface marked by stronger features; and no where do they act more sensibly on the divisions of the social body, already divided by the original difference of colour, and by individual liberty. It is not in the power of man to change that diversity of climates, which the inequalities of the soil produce on a small space of ground, and which give rise to the antipathy of the inha-

bitants of *tierra calienta* for those of *tierra fria*; an antipathy founded on the modifications of character, habits, and manners. These moral and political effects are manifested especially in countries, where the extremes of height and depression are most striking, where the mountains and the low lands have the greatest mass and extent. Such are New Grenada or Cundinamarca, Chili, and Peru, where the language of the inca furnishes many happy and natural expressions to denote this climatic opposition of constitution, inclinations, and intellectual faculties. In the state of Venezuela on the contrary, the *montaneros* of the lofty mountains of Bocono, Timotes, and Merida, form but a very slight part of the total population; and the populous valleys of the chain of the coast of Caraccas and Caripe are but three or four hundred toises above the level of the sea. It hence results, that in the political union of the states of Venezuela and New Grenada under the name of Columbia, the great mountain population of Santa-Fé, Popayan, Pasto, and Quito, has been balanced, if not entirely, at least more than half, by the addition of eight or nine hundred thousand inhabitants of *tierra caliente*. The state of the surface of the soil is less immutable than it's configuration. We may conceive the possibility of seeing the marked oppositions between the impenetrable forests of Guyana, and

the *llanos* destitute of trees and covered with grass, in time disappear: but what ages must pass, to render any change sensible in the immense steppes of Venezuela, Meta, Caqueta, and Buenos Ayres! What we have seen of the power of man struggling against the force of nature in Gaul, in Germany, and recently, but still beyond the tropics, in the United States, can scarcely give any just measure of what we must expect from the progress of civilization in the torrid zone. I have mentioned above how slowly forests are made to disappear by fire and the axe, when the trunks of trees are from eight to ten feet in diameter; and when in falling they rest one upon the other, and their wood, moistened by almost continual rains, is of an excessive hardness. The planters, who inhabit the *llanos* or *pampas*, do not generally recognize the possibility of subjecting the soil to cultivation; it is a problem which is not yet solved in a general view. The savannahs of Venezuela have not for the most part the same advantage as those of North America, which are traversed longitudinally by three great rivers, the Missouri, the Arkansas, and the Red River of Natchitoches; the savannahs of Araura, Calabozo, and Pao, are crossed in a transverse direction only by the tributary streams of the Oroonoko, the westernmost of which (the Cari, the Pao, the Acaru, and the Manapire)

have very little water in the season of drought. These streams scarcely flow at all toward the north; so that in the centre of the steppes there remains vast tracts of land (*bancos* and *mesas*) frightfully parched. The eastern parts, fertilized by the Portuguesa, the Masparro, and the Orivante, and by the tributary streams, which are very near each other, of these three rivers, are the most susceptible of cultivation. The soil is sand mixed with clay, covering a bed of quartz pebbles. The vegetable mould, the principal source of the nutrition of plants, is every where extremely thin. It is scarcely augmented by the fall of the leaves; which, though less periodical in the forests of the torrid zone, takes place however, as in temperate climates. During thousands of years the *llanos* have been destitute of trees and brushwood; a few scattered palms in the savannah add little to that hydruret of carbon, that extractive matter, which (according to the experiments of Saussure, Davy, and Braconnot) gives fertility to the soil. The social plants, that almost exclusively predominate in the steppes, are monocotyledons; and it is known how much grasses impoverish the soil, into which their roots with close fibres penetrate. This action of the killingias, paspalums, and cenchri, which form the turf, is every where the same; but where the rock is ready to pierce the earth, this varies according

as it rests on red sandstone, or on compact limestone and gypsum; it varies according as periodical inundations have accumulated mud on the lower grounds, or as the shock of the waters has carried away from the small elevations the little soil that covered them. Many solitary cultivated spots already exist in the midst of the pastures, where running water, and tufts of the mauritia palm, have been found. These farms, sown with maize, and planted with cassava, will multiply considerably, if an increase of the trees and shrubs be effected.

The aridity and the excessive heat of the *mesas** do not depend solely on the state of their surface, and the local reverberation of the soil; their climate is modified by the adjacent regions, by the whole steppe of which they form a part. In the deserts of Africa or Arabia, in the *llanos* of South America, in the vast heaths that reach from the extremity of Jutland to the mouth of the Scheldt, the stability of the limits of the desert, the savannahs, and the downs, depends for the most part on their immense extent, and the nakedness these plains have acquired from some revolution destructive of the ancient vegetation of our planet. By their extent, their continuity, and their mass,

* Little table-lands, *banks*, parts more elevated than the rest of the steppe.

they oppose the inroads of cultivation, and preserve, like inland gulfs, the stability of their boundaries. I will not touch upon the great question, whether in the Sahara, that Mediterranean of moving sands, the germs of organic life are increased in our days. In proportion as our geographical knowledge has extended, we see in the eastern part of the desert islets of verdure, oases covered with date-trees, crowd together in more numerous archipelagoes, and open their ports to the caravans; but we are ignorant whether the form of the oases have not remained constantly the same since the time of Herodotus. Our annals are too incomplete and too short, to follow Nature in her slow and progressive progress. From these spaces entirely bare, whence some violent catastrophe has swept away the vegetable covering and the mould; from those deserts of Syria and Africa, which, by their petrified wood, attest the changes they have undergone; let us now turn our eyes to the *llanos* covered with grasses, to the discussion of phenomena that come nearer the circle of our daily observations. The planters settled in the steppes of America have formed respecting the possibility of a more general cultivation the same opinions, as those which I deduced from the climatic action of these steppes considered as surfaces, or continuous masses. They have observed, that downs en-

closed within cultivated and wooded land resist the labourer a shorter time than soils alike circumscribed, but making part of a vast surface of the same nature. This observation is in fact extremely just, whether the soil be covered with heath, as in the north of Europe; with cistuses, mastic-trees, or palmettoes, as in Spain; or with cactuses, argemones, or brathys, as in equinoctial America. The more space the association occupies, the more resistance do the social plants oppose to the labourer. With this general cause are joined in the *llanos* of Venezuela the action of the small grasses, that impoverish the soil; the total absence of trees and brushwood; the sandy winds, the ardour of which is increased by the contact of a surface, that absorbs the rays of the Sun during twelve hours, and on which no shadow is ever projected, except that of the stalks of the aristides, chanchuses, and paspalums. The progress, which the vegetation of large trees, and the cultivation of dicotyledonous plants, have made in the vicinity of towns, for instance around Calabozo and Pao, prove what may be gained upon the steppe, by attacking it in small portions, enclosing it by degrees, and dividing it by copses, and canals of irrigation. Perhaps the influence of the winds, which render the soil sterile, might be diminished, by sowing in the large way, as on fifteen or twenty acres, the seeds of the

psidium, the croton, the cassia, or the tamarind, which prefer dry and open spots. I am far from believing, that men will ever cause the savannahs to disappear entirely; and that the *llanos*, useful for pasturage and the commerce of cattle, will ever be cultivated like the vallies of Aragua, or other parts near the coast of Caraccas and Cumana: but I am persuaded, that in the lapse of ages a considerable portion of these plains, under a government favorable to industry, will lose the savage aspect they have preserved since the first *conquest* of the Europeans.

These progressive changes, this increase of population, will not only augment the prosperity of those countries, but will also exert a beneficial influence on their moral and political state. The *llanos* form more than two thirds of that part of the ancient *capitania general* of Caraccas, which is situate to the north of the Oroonoko and the Rio Apure. Now, in times of civil troubles, the vast steppes, by their solitude, and the abundant subsistence they offer in their innumerable herds, serve at once as an asylum and support to a party, that is desirous of raising the standard of revolt. Armed bands (*guerillas*) may maintain themselves, and annoy the rear of the inhabitants of the coast, among whom civilization and agricultural wealth are concentred. If the Lower Oroonoko were not sufficiently

defended by the patriotism of a robust and warlike population, the present state of the *llanos* would render the effects of a foreign invasion on the western coasts doubly dangerous. The defence of the plains is intimately connected with that of Spanish Guyana; and, in speaking above * of the strategic importance of the mouths of the Oroonoko, I have shown, that the numerous fortresses and batteries, which have been raised along the northern coast from Cumana to Carthagena, are not the real ramparts of the United Provinces of Venezuela. To this important political view may be added another of not less consequence, and still more permanent. An enlightened government cannot see without regret, that the habits of a pastoral life, which cherish idleness and a vagabond spirit, prevail in more than two thirds of it's territory. That part of the population of the coast, which flows annually toward the *llanos*, to fix itself in the *hatos de ganado* †, and take care of the herds, makes a retrogade step in civilization. How can it be doubted, that the progress of agriculture, and the multiplication of villages where there is running wa-

* Vol. v, p. 709—15.

† A sort of farm composed of sheds, that serve as a dwelling for men (*hateros*, or *peones para el rodeo*), who take care of the half-wild herds of cattle and horses, or rather inspect them.

ter, would lead to a sensible melioration in the moral state of the inhabitants of the steppe? Softer manners, a taste for a sedentary way of life, and domestic virtues, would penetrate into them with agricultural labours.

After three days' journey, we began to perceive the chain of the mountains of Cumana, which separates the *llanos*, or, as they are often called here *, "the great sea of verdure," from the coast of the Caribbean sea. If the Bergantin be more than eight hundred toises high, it may be seen supposing only an ordinary refraction of one fourteenth of the arch, at twenty-seven nautical leagues distance †; but the state of the atmosphere long concealed from us the majestic view of this curtain of mountains. It appeared at first like a fog bank, which hid the stars near the pole at their rising and setting; by degrees this body of vapours seemed to augment, condense, take a bluish tint, and become bounded by sinuous and fixed outlines. All that the mariner observes on approaching a new land presents itself to the traveller on the borders of the steppe. The horizon begins to enlarge in some part, and the vault of the sky seems no longer to rest at an equal distance on the soil covered with grass. An inhabitant of the *llanos* is happy only when, according

* "Los lanos son como un *mar de yerbas*."

† Vol. ii, p. 206; and iii, p. 91.

to the simple expression of the country, "he can see every where well around him." What appears to us a covered country, slightly undulated, with a few scattered hills, is to him a frightful region bristled with mountains. Every thing is relative in our judgments on the inequality of the ground, and the state of the surface. After having passed several months in the thick forests of the Oroonoko, in places where you are accustomed when at any distance from the river, to see the stars only in the zenith, as through the mouth of a well, a journey in the steppes has something in it agreeable and attractive. The traveller feels new sensations; and, like the *llanero*, enjoys the happiness "of seeing well around him." But this enjoyment, as we ourselves experienced, is not of long duration. There is no doubt something solemn and imposing in the aspect of a boundless horizon, whether viewed from the summits of the Andes or the highest Alps, amid the immensity of the ocean, or in the vast plains of Venezuela and Tucuman. Infinity of space, as poets have said in every language, is reflected in ourselves; it is associated with ideas of a superior order; it elevates minds, that delight in the calm of solitary meditation. It is true also, that every view of an unbounded space bears a peculiar character. The view enjoyed from a solitary peak, varies according as the clouds reposing on

the plain extend in layers, are conglomerated in groups, or present to the astonished eye through broad openings the habitations of man, the labour of the fields, or the verdant tint of the aërial ocean. An immense sheet of water, animated by a thousand various beings even to it's utmost depths, changing perpetually it's colour and it's aspect, movable at it's surface like the element that agitates it, charms the imagination in long voyages by sea; but the dusty and crevíced steppe, during a great part of the year, dejects the mind by it's unchanging monotony. When, after eight or ten days' journey, the traveller becomes accustomed to the play of the *mirage*, and the brilliant verdure of a few tufts of mauritia * scattered from league to league, he feels the want of more varied impressions; he wishes to see again the great trees of the tropics, the wild rush of torrents, or hills and vallies cultivated by the hand of the labourer. If, unhappily, the phenomenon of the deserts of Africa, and that of the *llanos* or savannahs of the New Continent (a phenomenon the cause of which is lost in the obscurity of the first history of our planet), filled a still greater space, nature would be deprived of a part of the beautiful productions, which are peculiar to the torrid zone †. The heaths of the north, the steppes of

* Fan palm, sago-tree of Guyana.

† In calculating from maps constructed on a very large

the Wolga and the Don, are scarcely poorer in species of plants and animals, than are twenty-eight thousand square leagues of savannahs, that extend in a semicircle from north-east to south-west, from the mouths of the Oroonoko to the banks of the Caqueta and the Putumayo, beneath the finest sky of the globe, and in the climate of plantains and breadfruit trees. The influence of the equinoctial climate, every where else so vivifying, is not felt in places where the great associations of graminea have almost excluded every other plant. From the view of the ground we might have believed we were in the temperate zone, and even still farther toward the north: but a few scattered palms, and, at the entrance of the night, the fine constellations,

scale, I found the *llanos* of Cumana, Barcelona, and Caraccas, from the delta of the Oroonoko to the northern bank of the Apure, seven thousand two hundred square leagues; the *llanos* between the Apure and Putumayo, twenty-one thousand leagues; the *pampas* on the north-west of Buenos-Ayres, forty thousand square leagues; the *pampas* south of the parallel of Buenos-Ayres, thirty-seven thousand square leagues. The total area of the *llanos* of South America, covered with gramina, is consequently one hundred and five thousand two hundred square leagues, twenty leagues to an equatorial degree. (Spain has fifteen thousand of the same leagues.) The great plain of Africa, known by the name of Sahara, contains ten thousand square leagues, including the scattered oases, but not Bornou or Darfour. (The Mediterranean has only about eighty-nine thousand square leagues of surface.) See above, vol. iv, p. 314.

of the southern sky, (the Centaur, Canopus, and the innumerable nebulæ with which the Ship is resplendent,) had not reminded us, that we were only eight degrees distant from the equator.

A phenomenon, which had already fixed the attention of Deluc, and which in these latter years has exercised the sagacity of geologists, occupied us much during our journey across the steppes. I allude, not to those blocks of primitive rocks, which occur, as in the Jura, on the slope of limestone mountains, but to those enormous blocks of granite and syenite, which, in limits very distinctly marked by nature, are found scattered in the north of Holland, Germany, and the countries of the Baltic. It seems to be now proved, that, distributed as in radii, they came, at the time of the ancient revolutions of our globe, from the Scandinavian peninsula toward the south, and did not primitively belong to the granitic chains of the Harz and Erzgeberg, which they approach, without however reaching their foot *. Born in the sandy plains of the Baltic regions, and having till the age of eighteen known the existence of a rock only by these scattered blocks, I was doubly curious to see, whether the New World would shew me any analogous phenomenon. I was surprised at not

* Leopold de Buch, *Voyage en Norwège*, vol. i, p. 30.

seeing one of these blocks in the *llanos* of Venezuela, though these immense plains are bounded on the south by a group of mountains entirely granitic *, and exhibiting in it's denticulated and often columnar peaks traces of the most violent destruction †. Toward the north, the granitic chain of the Silla de Caraccas and Portocabello are separated from the *llanos* by a skreen of mountains, that are schistous between Villa de Cura and Parapara, and calcareous between the Bergantin and Caripe. I was no less struck by this absence of blocks on the banks of the Amazon. La Condamine had indeed affirmed, that, from the Pongo de Manseriche to the strait of Pauxis not the smallest stone was to be found. Now the basin of the Rio Negro and of the Amazon is also but a *llano*, a plain like those of Venezuela and Buenos-Ayres. The difference consists only in the state of vegetation. The two *llanos*, situate at the northern and southern extremities of South America, are covered with gramina ; they are savannahs destitute of tress : the intermediate *llano*, that of the Amazon, exposed to almost continual equatorial rains, is a thick forest. I do not remember having heard, that

* The *Sierra Parima*.

† Vol. iv, p. 461, 468, 469, 540, 566 ; vol. v, p. 177, 616, 676, 687.

the *pampas* of Buenos Ayres, or the savannah of the Missouri * and New Mexico, contain granitic blocks. The absence of this phenomenon appears general in the New World: and is so probably also in Sahara, in Africa; for we must not confound the rocky masses, that pierce the soil in the middle of the desert, and of which travellers often make mention, with simple scattered fragments. These facts seem to prove, that the blocks of Scandinavian granite, which cover the sandy countries situate to the south of the Baltic, and those of Westphalia and Holland, are owing to a particular rupture coming from the north, to a local revolution. The ancient conglomerate (red sandstone), that covers, according to my observations, a great part of the *llanos* of Venezuela and of the basin of the Amazon, contain no doubt fragments of the same primitive rocks, as constitute the neighbouring mountains; but the convulsions, of which these mountains exhibit evident marks, do not appear to have been attended by circumstances favorable to the removal of great blocks. This geognostic phenomenon was to me the more unexpected, since there exists no where in the world a smoother plain stretching as far as to the abrupt declivity of the Cordillera entirely

* Are there any blocks in North America to the north of the great lakes?

granitic. Even before my departure from Europe, I had observed with surprise, that primitive blocks were alike wanting in Lombardy, and in the great plain of Bavaria, which appears to be the bottom of an ancient lake, raised two hundred and fifty toises above the level of the ocean. It is bounded on the north by the granites of the Upper Palatinate; and on the south by Alpine limestone, transition-*thons-chiefer*, and the mica-slates of the Tyrol.

We arrived, July the 23d, at the town of Nueva Barcelona, less fatigued by the heat of the *llanos*, to which we had been long accustomed, than by the *winds of sand*, which occasion painful chaps in the skin. Seven months before, in going from Cumana to Caraccas, we had rested a few hours at the *Morro* de Barcelona, a fortified rock, which, toward the village of Pozuelos, is joined to the continent only by a neck of land. We were received in the most affectionate manner, and with the kindest hospitality, in the house of a wealthy merchant of French extraction, don Pedro Lavié. Accused of having given an asylum to the unfortunate España, when he was a fugitive on these coasts in 1796, Mr. Lavié was arrested by the orders of the *Audiencia*, and dragged as a prisoner to Caraccas. The friendship of the governor of Cumana, and the remembrance of the services he had rendered to the dawning industry of those

countries, contributed to procure for him his liberty. We had endeavoured to soften his captivity by visiting him in his prison; and we had now the satisfaction of finding him in the midst of his family. His physical complaints had been aggravated by confinement; and he has sunk into the grave, without having seen the light of those days of independance, which his friend, don Joseph España, had predicted at the moment of his execution. "I die," said this man formed for the accomplishment of grand projects *, "I die an ignominious death; but my fellow citizens will soon piously collect my ashes, and my name will reappear with glory." These remarkable words were uttered in the public square of Caraccas, on the 8th of May, 1799; they were repeated to me the same year by persons, some of whom abhorred the projects of España, as much as the others deplored his fate.

I have spoken above † of the importance of the trade of Nueva Barcelona. This small town, which in 1790 had scarcely ten thousand inhabitants, and in 1800 more than sixteen thousand, was founded ‡ by a Catalonian *con-*

* *Essai Polit. sur la Nouv. Espagne*, tom. ii, p. 819. See also vol. iii, p. 414 of the present work.

† See above, vol. iii, p. 361.

‡ *Caulin*, p. 173, 199, 207. What Mr. Depons relates (vol. iii, p. 205,) of the origin of this town, is not altogether conformable to history.

quistador, Juan Urpin, in 1637. A fruitless attempt was then made, to give the whole province the name of New Catalonia. As our maps often mark two towns, Barcelona and Cumanagoto, instead of one, and the two names are considered as synonimous, it may be useful to clear up the cause of this error. Anciently at the mouth of the Rio Nevers, there was an *Indian* town, built in 1588 by Lucas Faxardo, and named *San Cristoval de los Cumanagotos*. This town was peopled solely by natives who came from the saltworks of Apaicuare. In 1637, Urpin founded, two leagues farther inland, the *Spanish town* of *Nueva Barcelona*, which he peopled with some of the inhabitants of Cumanagoto and many Catalonians. For thirty-four years quarrels were incessantly arising between the two neighbouring communities, till 1671, when the governor Angulo succeeded in persuading them, to unite on a third spot, where the town of Barcelona now stands; the latitude of which, according to my observations *, is 10° 6′ 52″.

* *Plaza Mayor.* This is only the result of six circummeridian heights of Canopus, taken in the same night. *Las Memorias d'Espinosa* (vol. ii, p. 80) give 10° 9′ 6″. Mr. Ferrer found (*Conn. des Tems*, 1817, p. 322) 10° 8′ 24. I know not where these observations were made, but I believe they give the latitude too far north. For, at Caraccas, Guyana, and the Havannah, my observations differed only a few seconds from those of Mr. Ferrer. The difference of latitude between the town and the *Morro* appeared to me to be

The ancient town of Cumanagoto is celebrated in the country for a miraculous image of the Virgin *, which the Indians say was found in the hollow trunk of a *tutumo*, or old calebash tree (*crescentia cujete*). This virgin was carried in procession to Nueva Barcelona; but whenever the clergy were dissatisfied with the inhabitants of the new city, she fled away at night, and returned to the trunk of the tree at the mouth of the river. This prodigy did not cease, till a large and fine convent (the college of the *Propaganda*) was built, to receive the monks of Saint Francis. We have seen above, that, in a similar case, the bishop of Caraccas caused the image of Our Lady *de los Valencianos* to be placed in the archives of the bishoprick, where she remained thirty years under seal.

The climate of Barcelona is not so hot as that of Cumana, but extremely damp, and

3′ 40″. I have elsewhere discussed the longitude of Nueva Barcelona, and the results of my chronometrical determinations compared with those of Messrs. Fidalgo and Ferrer (*Observ. Astr. Tom.* ii, p. 80). On the banks of the Rio Unare, and farther west on the Rio Ucheri, near the beautiful valley of Cupira, so abundant in cacao, there existed two other towns in the seventeenth century, by the names of Tarragona and San Miguel de Batei.

* *La milagrosa imagen de Maria Santissima del Socorro*, also called *la Virgen del Tutumo*.

somewhat unhealthy in the rainy season. Mr. Bonpland had supported well the difficult journey across the *llanos*; and had regained his strength, and his great activity. With respect to myself, I suffered more at Barcelona than I had done at Angostura, immediately after having terminated the navigation of the rivers. One of those extraordinary tropical rains, during which at sunset drops of an enormous size fall at great distances from one another, had given me such uneasy sensations, as seemed to menace an attack of the typhus, which then prevailed on that coast. We remained near a month at Barcelona, under the care of the most watchful friendship. We there found also that excellent ecclesiastic, fray Juan Gonzales, of whom I have often spoken, and who had traversed the Upper Oroonoko before us. He regretted the little time we had been able to employ in visiting that unknown country; and examined our plants and animals with that interest, which we feel for the productions of a distant region, that we have once inhabited. Fray Juan had resolved to go to Europe, and to accompany us as far as the island of Cuba. From this time we were together for seven months; he was gay, intelligent, and obliging. Who could foresee the evils, that awaited him? He took charge of a part of our collections; a common friend confided to him a child, that he

wished to have educated in Spain: the collections, the child, and the young ecclesiastic, were all buried in the waves *.

South-east of Nueva Barcelona, at the distance of two leagues, rises a lofty chain of mountains, abutting on the *Cerro del Bergantin*, which is visible at Cumana. This spot is known by the name of the *hot waters (aguas calientes)*. When I felt my health sufficiently restored, we made an excursion thither on a cool and misty morning. The waters, loaded with sulphuretted hydrogen, issue from a quartzous sandstone, lying on the same compact limestone, which we had examined at the Morro. We again found in this limestone intercalated beds of black hornstein, passing into *kieselschiefer*. It is not however a transition rock; it rather approaches, by it's position, it's division into small strata, it's whiteness, and it's dull and conchoïdal fractures, (with very flattened cavities) the limestone of Jura. The real *kieselschiefer* and Lydian stone have not been observed hitherto except in the transition slates and limestones. Is the sandstone, from which the springs of the Bergantin issue, of the same formation as the sandstone which we described † at the Impossible and at Tumiriquiri?

* See above, vol. iii, p. 350; vol. v, p. 622.

† Vol. iii, p. 23 and 94.

The thermal waters have only a temperature of 43·2° cent. (the atmosphere being 27°); they flow first to the distance of forty toises over the rocky surface of the ground; are then precipitated into a natural cavern; and pierce through the limestone, to issue out at the foot of the mountain, on the left bank of the little river Narigual. The springs, while in contact with the oxygen of the atmosphere, deposit a good deal of sulphur. I did not collect, as I had done at Mariara, the bubbles of air, that rise in jets from these thermal waters. They no doubt contain a large quantity of azot, because the sulphuretted hydrogen decomposes the mixture of oxygen and azot dissolved in the spring. The sulphurous waters of San Juan, which issue from calcareous rock like those of Bergantin, have also but a weak temperature (31·3°); while in the same region, the temperature of the sulphurous waters of Mariara and las Trincheras (near Portocabello), which gush immediately from gneiss-granite, is 58·9° the former, and 90·4° the latter *. It would seem as if the heat, which these springs acquire in the interior of the globe, diminishes in proportion as they pass from primitive to secondary superposed rocks.

* L. c. Vol. iv, p. 52, 195, 272. I am ignorant of the temperature of the hot, and hydrosulphurous springs of Provisor, near San Diego, half a league distant from Nueva Barcelona, toward the south.

Our excursion to the *aguas calientes* of Bergantin ended with a vexatious accident. Our host had lent us one of his finest saddle horses. We were warned at the same time not to ford the little river of Narigual. We passed over a sort of bridge, or rather some trunks of trees placed close together, and we made our horses swim, holding their bridles. The horse I had rode suddenly disappeared, after struggling for some time under water: all our researches to discover the cause of this accident were fruitless. Our guides conjectured, that the animal's legs had been seized by the *caymans*, which abound in those parts. My perplexity was extreme: the delicacy and the fortune of my host forbade me to think of repairing his loss; and Mr. Lavie, more attentive to our situation, than to the fate of his horse, endeavoured to tranquillize us by exaggerating the facility, with which fine horses were procurable from the neighbouring savannahs.

The crocodiles of the Rio Neveri are large and numerous, especially near the mouth of the river; but in general they are less fierce than the crocodiles of the Oroonoko. These animals display the same contrasts of ferocity in America as in Egypt and Nubia, which we recognize when we compare with attention the narrative of the unfortunate Burckhardt, and that of Mr. Belzoni. The state of cultivation of different

countries, and the population more or less accumulated in the proximity of rivers, modify the habits of these large *sauriens*, timid when on dry ground, and fleeing from man even in the water, when they find abundant nourishment, and when they perceive any danger in attacking him. The Indians of Nueva Barcelona convey wood to market in a singular manner. Large logs of zygophyllum and cæsalpinia* are thrown into the river, and carried down by the stream, while the proprietor of the wood and his eldest son swim here and there, to set afloat the pieces, that are stopped by the windings of the banks. This could not be done in the greater part of those American rivers, in which crocodiles are found. The town of Barcelona has not, like Cumana, an Indian suburb; and if some natives be seen, they are inhabitants of the neighbouring missions, or of huts scattered in the plain. Neither the one nor the other are of the Caribbee race, but a mixture of the Cumanagotoes, Palenkas, and Piritoos, short, stunted, indolent, and addicted to drinking. Fermented cassava is here the favorite beverage; the wine of the palm tree, which is used in

* The lecythis ollaria in the vicinity of Nueva Barcelona furnishes excellent timber. We saw trunks of this tree seventy feet high. Around the town, beyond that arid zone of cactus which separates Nueva Barcelona from the steppe, grow the clerodendrum tenuifolium, the ionidium itubu, which resembles the viola, and the allionia violacea.

Oroonoko, being almost unknown on the coast. It is curious to observe, that men in different zones, to satisfy the passion of inebriety, employ not only all the families of monocotyledonous and dicotyledonous plants, but even a poisonous agaric (amanita muscaria), of which, with disgusting economy, the Coriacs have learnt to drink the same juice several times during five successive days *.

The packet boats (*correos*) from Corunna bound for the Havannah and Mexico had been due three months; and it was believed they had been taken by the English cruisers stationed on this coast. Anxious to reach Cumana, in order to avail ourselves of the first opportunity that might offer for Vera Cruz, we hired an open boat (*lancha*). These craft are employed habitually in the latitudes east of cape Codera, where the sea is scarcely ever rough. The

* Mr. Langsdor (*Wetterauisches Journal*, P. I, p. 254,) first made known this very extraordinary physical phenomenon, which I prefer describing in latin: "Coriæcorum gens, in ora Asiæ septentrioni opposita, potum sibi excogitavit ex succo inebriante agarici muscarii. Qui succus (æque ut asparagorum), vel per humanum corpus transfusus, temulentiam nihilominus facit. Quare gens misera et inops, quo rarius mentis sit suæ, propriam urinam bibit identidem: continuoque mingens rursusque hauriens eundem succum (dicas, ne ulla in parte mundi desit ebrietas), pauculis agaricis producere in diem quintum temulentiam potest."

lancha was laden with cacao, and carried on a contraband trade with the island of Trinidad. For this reason the proprietor thought we had nothing to fear from the enemy's vessels, which then blocked up all the Spanish ports. We embarked our collections of plants, our instruments, and our monkeys; and, the weather being delightful, we hoped to make a very short passage from the mouth of the Rio Neveri to Cumana: but we had scarcely reached the narrow channel between the continent and the rocky isles of Borracha and the Chimanas, when, to our great surprise, we met with an armed boat, which, hailing us at a great distance, fired some musket-shot at us. The boat belonged to a privateer of Halifax; and I recognized among the sailors a Prussian, a native of Memel, by his physiognomy and his accent. I had found no opportunity, since my arrival in America, of speaking my native language, and I could have wished to have used it on a less unpleasant occasion. Our protestations were without effect: we were carried on board the privateer, and the captain, affecting not to recognize the passports delivered by the governor of Trinidad for the illicit trade, declared, that we were lawful prize. Being a little in the habit of speaking English, I entered into a negociation with the captain, not to be taken to Nova Scotia, but to be set on shore on the

neighbouring coast. While I endeavoured in the cabin to defend my own rights, and those of the proprietor, I heard a noise upon the deck. Something was whispered to the captain, who left us in consternation. Happily for us, an English sloop of war, the Hawk, was cruising in those parts, and had made signals to the captain to bring to; which he not being prompt to obey, a gun was fired from the sloop, and a midshipman sent on board our vessel. He was a polite young man, and gave me hopes, that the boat, laden with cacao, would be given up, and that on the following day we might pursue our voyage. In the meantime he invited me to accompany him on board the sloop, assuring me, that his commander, captain John Garnier, of the royal navy, would furnish me with better accommodation for the night, than I should find in the vessel from Halifax.

I accepted these obliging offers, and was received with the utmost kindness by captain Garnier, who had made the voyage to the north-west coast of America with Vancouver, and who appeared to be highly interested in all I related to him of the great cataracts of Atures and Maypure, the bifurcation of the Oroonoko, and it's communication with the Amazon. He named to me several of his officers, who had been with lord Macartney in China. I had not for a year enjoyed the society of so many well-informed

persons. They had learnt from the English newspapers the object of my enterprise. I was treated with great confidence, and the commander gave me up his own stateroom. They gave me at parting the astronomical Ephemerides for the years which I had not been able to procure in France or Spain. I owe to captain Garnier the observations I made on the satellites beyond the equator, and feel it a duty to record here the gratitude I feel for his kind offices. Coming from the forests of Cassiquiare, and having been confined during whole months to the narrow circle of missionary life, we felt a soothing gratification at meeting for the first time with men, who had sailed round the world, and enlarged their ideas by the view of so varied a spectacle. I quitted the English vessel with impressions, which are not yet effaced from my remembrance, and which led me to cherish still more the career I had chosen.

We continued our passage on the following day, and were surprised at the depth of the channels between the Caracas Islands, where the sloop manœuvred, almost touching the rocks. How much do these calcareous islets, of which the form and direction recal to mind the great catastrophe that separated them from the main land, differ in their aspect from the volcanic archipelago on the north of Lancerota*,

* See above, vol. i, p. 65.

where the hills of basalt seem to have been lifted up from the bottom of the sea! The frequency of the pelicans, which are larger than our swans, and of flamingoes, which fished in the nooks, or harassed the pelicans in order to seize their prey, indicated our approach to the coast of Cumana. It is curious to observe at sunrise how the sea-birds suddenly appear, and animate the landscape, reminding us, in the most solitary scenes, of the activity of our cities at the dawn of day. We reached at nine in the morning the gulf of Cariaco, which serves as a roadstead to the town of Cumana. The hill, crowned by the castle of St. Antonio, stood prominent from it's whiteness on the dark curtain of the inland mountains. We recognized with pleasure the shore, where we had culled the first plants of America, and where, some months later, Mr. Bonpland had been in such danger. Among the cactuses, that rise in columns and candelabras twenty feet high, appear the Indian huts of the Guaykeries. Every part of the landscape was known to us; the forest of cactus, the scattered huts, and that enormous ceiba, beneath which we loved to bathe at the approach of night. Our friends at Cumana came out to meet us; men of all casts, whom our frequent herborizations had brought into contact with us, expressed still greater joy, as a report of our death on the banks of the Oroonoko had been

current for several months. These gloomy reports had arisen either from the severe illness of Mr. Bonpland, or from our boat being nearly lost in a gust of wind above the mission of Uruana.

We hastened to visit the governor, don Vicente Emparan, whose recommendations and constant solicitude had been so useful to us during the long journey we had just terminated. He procured a house for us in the centre of the town*, perhaps too lofty in a country exposed to violent earthquakes, but extremely convenient for our instruments. We enjoyed from it's terraces a majestic view of the sea, the isthmus of Araya, and the archipelago of the isles of Caraccas, Picuita, and Borracha. The port of Cumana was every day more strictly blockaded, and the vain expectation of Spanish packets retained us two months and a half longer in that place. We were often tempted to go to the Danish islands, enjoying a happy neutrality; but feared that, if we left the Spanish colonies,

* *Casa de don Pasqual Martinez*, on the north-east of the great square, near which I had made observations from July the 28th to November the 17th, 1799. All the astronomical observations, and those of mirage (vol. iii, p. 542), which are posterior to August the 29th, 1800, were made in the house of don Martinez. I relate these circumstances, because they may be interesting at some future period to those, who may wish to examine the precision of my labours

we might find some obstacles to our return. With the ample permissions, which in a moment of favour had been granted to us, nothing was to be hazarded, that might displease the local authorities. We employed our time in completing the Flora of Cumana, geognostically examining the eastern part of the peninsula of Araya, and observing a considerable number of eclipses of satellites, which confirmed the longitude of the place already obtained by other means. We also made experiments on the extraordinary refractions, on evaporation, and on atmospheric electricity.

The live animals which we had brought from the Oroonoko were objects of great curiosity to the inhabitants of Cumana. The capuchin of the Esmeralda (simia chiropotes), which so much resembles man in the expression of it's physiognomy; and the sleeping monkey (simia trivirgata), which is the type of a new groupe; had never yet been seen on that coast. We destined them for the menagery of the Garden of Plants at Paris. The arrival of a French squadron, which had failed in an attack upon Curassao, having furnished us unexpectedly with an excellent opportunity for sending them to Guadaloupe, general Jeannet, and the commissary Bresseau, agent of the executive power at the Antilles, promised to take on themselves this commission. The monkeys and birds died

at Guadaloupe, but fortunately the skin of the simia chiropotes, which exists no where else in Europe, was sent a few years ago to the Garden of Plants; where the *couxio* (simia satanas), and the stentor or alouate of the steppes of Caraccas (simia ursina), of which I have given the figures in my *Recueil de Zoologie et d' Anatomie comparée*, had been already received. The arrival of so great a number of military Frenchmen, and the manifestation of political and religious opinions, that were not altogether conformable to those by which mother-countries think to confirm their authority, excited a singular agitation in the population of Cumana. The governor treated the French authorities with those forms of civility, which the intimate connexion, that subsisted at that period between France and Spain, prescribed. In the streets the mulattoes crowded round the agent of the Directory, whose dress was rich and theatrical; but as men with a white skin inquired also with indiscreet curiosity, whenever they could make themselves understood, concerning the degree of influence granted by the republic to the planters in the government of Guadaloupe, the king's officers redoubled their zeal in furnishing provision for the little squadron. Strangers, who boasted that they were free, appeared to these as troublesome guests; and I saw that in a country, of which the growing prosperity depended on

clandestine communications with the islands, and on a freedom of trade forced from the ministry, the European Spaniards were proud of the antique wisdom of the code of laws (*leyes de Indias*), that permitted the entrance of foreign vessels into their ports only in extreme cases of want or distress. I have dwelt on these contrasts between the restless desires of the planters, and the mistrusting immobility of the governors, because they throw some light on the great political events, which, long prepared, have at length separated Spain from it's colonies, or, as we might perhaps say with more precision, from it's provinces beyond sea.

We again passed some agreeable days, from the third to the fifth of November, at the peninsula of Araya, situate beyond the gulf of Cariaco, opposite to Cumana, and of which I have already described the pearls*, the sulphurous deposits, and the submarine springs of liquid and colourless petroleum. We were informed, that the Indians carried to the town from time to time considerable quantities of *native alum*, found in the neighbouring mountains. The specimens which were shown to us sufficiently indicated, that it was neither alunite †, similar to the rock of Tolfa and Piombino, nor those capillary and silky salts of alcaline sulphat of alumin and mag-

* Vol. ii, p. 239–299.

† *Alaunstein*, alum stone.

nesia, that line the clefts and cavities of rocks, but real masses of native alum, with a conchoid or imperfectly lamellar fracture. We were led to hope, that we should find the *mine of alum* in the slaty cordillera of Maniquarez, and so new a geognostic phenomenon was calculated to fix all our attention. Juan Gonzalez, an ecclesiastic, and the treasurer, don Manuel Navarete, whose counsels had been useful to us from our first arrival on this coast, accompanied us in our little excursion. We disembarked near Cape Caney, and again visited the ancient saltpit, converted into a lake by the irruption of the sea, the fine ruins of the castle of Araya, and the calcareous mountain of Barigon, which, from it's steepness on the western side, is somewhat difficult of access. Muriatiferous clay mixed with bitumen and lenticular gypsum, and sometimes passing to a darkish brown clay, destitute of salt, is a formation widely spread in this peninsula, in the island of Margaretta, and on the opposite continent, near the castle of St. Antonio of Cumana. It is even very probable, that the existence of this formation has contributed to those ruptures and rents in the ground, which strike the geologist when he is placed on one of the eminences of the peninsula of Araya. The cordillera of this peninsula, composed of micaceous slate and clayslate, is separated on the north from the chain of mountains of the island

of Margaretta, which are of a similar composition, by the channel of Cubagua; and toward the south, from the lofty calcareous chain of the continent, by the gulf of Cariaco. The whole intermediate space appears to have been filled heretofore with muriatiferous clay; and it is no doubt the continual erosions of the ocean, that have removed this formation, and converted the plain first into lakes, then into gulfs, and finally into navigable channels. The account of what has passed in the most modern times at the foot of the castle of Araya, on the irruption of the sea into the ancient saltpit, the form of the lagoon of Chacopata, and a lake four leagues in length, which cuts the Island of Margaretta nearly into two parts, furnish evident proofs of these successive erosions. In the singular configuration of the coasts, in the Morro of Chacopata; in the little islands of the Caribbees, the Lobos, and Tunal; in the great island of Coche, and the capes of Carnero and Mangliers; the remains of an isthmus * still seem to appear, which, stretching from north to south, joined heretofore the peninsula of Araya to the island of Margaretta. In this last island a neck of very low land, three thousand toises long, and less than two hundred toises broad, alone conceals

* The map *de la Isla Margarita y de sus canales*, published by Mr. Fidalgo in 1816, indicates very clearly these geognostic relations.

on the northern sides the two hilly groupes, known by the names of la Vega de San Juan, and of Macanao. The *Laguna grande* of Margaretta has a very narrow opening toward the south, and small boats pass *arastrados*, that is by a *portage*, over the neck of land or northern dyke. Though the waters on these shores seem at present to recede from the continent, it is notwithstanding very probable, that in the lapse of ages, either by an earthquake, or by a sudden intumescence of the ocean, the long island of Margaretta will be divided into two rocky islands of a trapezoidal form.

On climbing up the Cerro del Barigon, we repeated the experiments made at the Oroonoko, on the difference of temperature of the air and the decomposed rock. The temperature of the former was only 27° cent., toward eleven in the morning, on account of the effect of the breeze; while that of the latter rose to 49·6°. The sap that rises in the *candelabra* cactuses (cactus quadrangularis) was from 38° to 41°. This heat was shown by a thermometer, the ball of which I placed within the fleshy and succulent stem of the cactus. This interior temperature of a plant is composed of that of the sand in which it's roots are fixed, and that of the external air modified by the state of the surface of the stem exposed to the rays of the Sun, it's evaporation, and the conducting power of the

wood. It is consequently the effect of very complicated causes. The limestone of Barigon, which makes a part of the great formation of sandstone or calcareous breccia of Cumana*, is filled with fossil shells in as perfect preservation as those of other tertiary limestones in France and Italy. We detached some blocks for the cabinet of the King at Madrid, containing oysters of eight inches in diameter, pectens, venuses, and lithophyte polypi. I recommend to naturalists better versed in the knowledge of fossils than I was at that period, to examine with care this mountainous coast, which is easy of access to European vessels in their way to Cumana, Guayra, or Curassao. It would be curious to discover whether any of these shells, and these species of petrified zoophytes, still inhabit the sea of the West Indies, as it appeared to Mr. Bonpland, and as is the case in the island of Timor, and perhaps in Guadaloupe.

We set sail the 4th of November, at one in the morning, in search of the mine of native alum. I took with me the timekeeper, and my large Dollond telescope, to observe at the *Laguna chica*, east of the village of Maniquarez, the immersion of the first satellite of Jupiter; this design however was not accomplished, contrary winds having prevented our arrival before

* Vol. i, p. 262; Vol. iii, p. 10.

daylight. The spectacle of the phosphonescence of the ocean, embellished by the sports of the porpoises which surrounded our canoe, could alone compensate for this delay. We again passed those spots, where springs of petroleum gush from micaslate * at the bottom of the sea, and the smell of which is perceived from afar. When we recollect, that farther to the east, near Cariaco, the hot † and submarine waters are sufficiently abundant to change the temperature of the gulf at it's surface, we cannot doubt, that the petroleum is the effect of a distillation at an immense depth, issuing from those primitive rocks, beneath which lies the focus of all volcanic commotions.

The *Laguna chica* is a cove surrounded by perpendicular mountains, and connected with the gulf of Cariaco only by a narrow channel twenty-five fathoms deep. It seems, like the fine port of Acapulco, to have been formed by the effect of an earthquake. A beach shows, that the sea here retires from the land, as it

* Vol. ii, p. 290. The petroleum of the Caraccas islands, and that of Buen Pastor, of which I have spoken above (vol. iii, p. 186; vol. ii, p. 51), issue from secondary formations. Is not this a direct proof of the communication of the crevices that traverse the micaslate, limestone, and clay, lying on each other? I was also assured, that there is a spring of petroleum to the west of Maniquarez, in the inland.

† Vol. iii, p. 199.

does on the opposite coast of Cumana. The peninsula of Araya, which narrows between the capes Mero and las Minas to one thousand four hundred toises broad, is a little more than four thousand near the *Laguna chica*, reckoning from one sea to the other. We had to cross this inconsiderable distance in order to find the native alum, and reach the cape called the *Punta de Chuparuparu*. The road is difficult only because no path is traced; and between precipices of some depth you are obliged to step over ridges of bare rock, the strata of which are much inclined. The culminant point is nearly two hundred and twenty toises high; but the mountains, as it often happens in a rocky isthmus, display very singular forms. The *Tetas* of Chacopata and Cariaco, halfway between the *Laguna chica* and the town of Cariaco, are real peaks, which appear isolated when seen from the platform of the castle of Cumana. The vegetable earth in this country reaches only thirty toises above the level of the sea. Sometimes there is no rain during fifteen months*; if, however, a few drops fall immediately after the flowering of the melons and gourds, they yield fruits that weigh from sixty to seventy pounds, notwithstanding the apparent dryness of the air. I say the apparent dryness, for my

* Vol. iii, p. 204.

hygrometric observations prove, that the atmosphere of Cumana and Araya contains near nine tenths of the quantity of watery vapours necessary to it's perfect saturation. It is this air, at once hot and humid, that nourishes the *vegetable fountains*, the cucurbitaceous plants, the agaves and melocactuses half-buried in the sand. When we visited the peninsula the preceding year, there was a dreadful scarcity of water; the goats, wanting grass, died by hundreds. During our stay at the Oroonoko, the order of the seasons seemed to be entirely changed. At Araya, Cochen, and even in the island of Margaretta, it had rained abundantly; and the remembrance of those showers occupied the imagination of the inhabitants, as a fall of aërolites would that of the naturalists of Europe.

The Indian who was our guide scarcely knew in what direction we should find the ore of alum; he was ignorant of it's real situation. This ignorance of localities characterizes here almost all the guides, who are chosen among the most indolent class of the people. We wandered for eight or nine hours, among rocks totally bare of vegetation. The micaceous slate passes sometimes to clayslate of a darkish gray. I was again struck by the extreme regularity in the direction and inclination of the strata. They run north 50° east, inclining from 60° to 70° to the north west. This is the general direction,

which I had observed in the gneiss-granite of Caraccas and the Oroonoko, in the hornblende slates of Angostura, and even in the greater part of the secondary rocks we had just examined. The beds, on a vast extent of land, make the same angle with the meridian of the place; they present a parallelism (or rather a *loxodromism*), which may be considered as one of the great geognostic laws susceptible of being verified by precise measures. In advancing toward cape Chuparuparu, the size of the veins of quartz, that cross the micaslate, increased. We found some that were from one to two toises broad, full of small fasciculated crystals of rutile-titanite. We sought in vain for cyanite, which we had discovered in some blocks near Maniquarez. Farther on, the micaslate furnishes not veins, but little beds of graphite or carburetted iron. They are from two to three inches thick, and have precisely the same direction and inclination as the rock. Graphite, in primitive soils, marks the first appearance of carbon on the globe, that of carbon uncombined with hydrogen. It is anterior to the period when the surface of the earth became covered with monocotyledonous plants. We enjoyed from the height of those wild mountains a majestic view of the island of Margaretta. Two groups of mountains, which we have already mentioned, those of Macanao, and la Vega de San Juan, rise from the bosom

of the waters. The capital of the island, la Asuncion *, the port of Pampatar, and the villages of Pueblo de la Mar, Pueblo del Norte, and San Juan, belong to the second and most easterly of these groups. The western group, the Macanao, is almost entirely uninhabited. The isthmus, that divides these large masses of micaslate, was scarcely visible; it appeared disfigured by the effect of the *mirage*, and we recognized this intermediate part, cut by the *Laguna grande*, only by two small hills †, in the form of a sugarloaf, in the meridian of the Punta de Piedras. Nearer, we look down on the small desert archipelago of the four Morros del Tunal, the Caribbee, and the Lobos islands.

After many vain searches, we at length found, before we descended to the northern coast of the peninsula of Araya, in a ravine of very difficult access (*arroyo del Robalo*), the mineral which had been shown to us at Cumana. The micaslate changed suddenly into carburetted and shining clayslate. It was an ampelite; and the waters (for there are small springs in those parts, and some have recently been discovered near the village of Maniquarez) were impregnated with yellow oxyd of iron, and had a styptic taste. We found the sides of the neighbour-

* Lat. 11° 0′ 30″; long. 0° 19′ east of the meridian of Cumana.

† Lat. 10° 57′; long. 0° 3′ 30″ east of Cumana.

88188

ing rocks lined with capillary sulphat of alumin in effervescence; and real beds, two inches thick, full of native alum, stretched as far as the eye could reach in the clayslate. The alum is grayish white, somewhat dull at the exterior, and of an almost glassy lustre within. It's fracture is not fibrous, but imperfectly conchoid. It is hemidiaphanous, when it's fragments are thin; and has a sweetish and astringent taste, without any bitter mixture. I proposed to myself the question even on the spot, whether this alum, so pure, and filling beds in the clayslate without leaving the smallest void, be of a contemporary formation with the rock; or must be admitted to be of a recent, and in some sort secondary origin, like the muriat of soda, found sometimes in small veins, where strongly concentrated springs traverse beds of gypsum or clay. Nothing in these places seems to indicate a mode of formation, which may be renewed in our days. The slaty rock exhibits no open cleft; and particularly none is found parallel to the direction of the slates. It may also be inquired, whether this aluminous slate be a transition formation lying on the primitive micaslate of Araya, or arise merely from a change of composition and texture in the beds of micaslate. I lean toward the latter proposition; for the transition is progressive, and the argillaceous slate (*thonschiefer*) and micaslate appear to me to constitute here

but one sole formation. The presence of cyanite, rutile-titanite, and garnets, and the absence of lydianstone, and all fragmentary or arenaceous rocks, seem to characterize the formation we describe as primitive. It is asserted, that even in Europe ampelite and greenstone are found, though rarely, in slates anterior to transition-slate.

When, in 1785, after an earthquake, a great rocky mass was broken off in the Aroyo del Robalo, the Guaykeries of los Serritos collected fragments of alum five or six inches in diameter, extremely pure and transparent. It was sold in my time at Cumana to the dyers and shoemakers, at the price of two reals (one quarter of a piastre) a pound, while alum from Spain cost twelve reals. This difference of price was much more the effect of prejudice, and the shackles of trade, than of the inferior quality of the alum of the country, which is used without undergoing any purification. It is also found in the chain of micaslate and clayslate on the north-west coast of the island of Trinidad, at la Margaretta, and near cape Chuparupara, north of the Cerro del Distiladero *. The Indians, naturally addicted to

* Another place was indicated to us, west of Bordones, the Puerto Escondido. But that coast appeared to me to be wholly calcareous; and I cannot conceive where could be the situation of ampelite and native alum on this point. Was it to be found in the beds of slaty clay, that alternate with

concealment, are by no means inclined to make known the spots, whence they obtain native alum; but this must be abundant, for I have seen very considerable quantities in their possession at a time. It would be of importance to the government of Venezuela, to establish regular works, either of the ore we have just described, or in the aluminous slate that accompanies it. The latter might be roasted, lixiviated, and concentrated (by *graduation*) by the fervent Sun of the tropics.

South America at present receives it's alum from Europe, as Europe in it's turn received it from the natives of Asia till the fifteenth century. Mineralogists, before my travels, knew no other substances, which, without addition, calcined or not calcined, could directly yield alum (sulphat of alumin and potash), except rocks of trachytic formation, and small veins traversing beds of lignite and bituminous wood. Both these substances, of so different an origin, contain all that constitutes alum, that is to say, alumin, sulphuric acid, and potash. The ores of Tolfa, Milo, and Nipoligo; those of Montione, in which silica does not accompany the alumin; the siliceous breccia of Mont-Dore, so well de-

the alpine limestone of Cumanacoa? Vol. iii, p. 76. Fibrous alum is found in Europe only in formations posterior to those of transition, in lignites, and other tertiary formations that belong to the lignites.

scribed by Mr. Cordier, which contains sulphur in it's cavities; the alumiferous rocks of Parad and Beregh in Hungary, which belong also to trachytic and pumice conglomerates; are no doubt owing to the penetrating of sulphurous acid vapours*. They are the products of a feeble and prolonged volcanic action, as may be easily ascertained in the solfaterras of Puzzuoli and the Peak of Teneriffe. The alumite of Tolfa, which, since my return to Europe, I examined conjointly with Gay-Lussac on the spot, has, by it's oryctognostic characters and it's chemical composition, a considerable affinity to compact feldspar†, which constitutes the basis of so many trachytes and transition porphyries. It is a siliciferous subsulphat of alumin and potash, a compact feldspar, with the addition of sulphuric acid completely formed in it. The waters circulating in these alumiferous rocks of volcanic

* Gay-Lussac, in the *Annales de Chimie* (old series), Tom. 55, p. 266. Descotils in the *Annales des Mines*, 1816, p. 374. Cordier, in the *Annales de Chimie et de Physique*, Tom. 9, p. 71—88. Beudant, *Voyage en Hongrie*, tom. 3, p. 446—471.

† This feldspar contains, according to Klaproth, more silica than the alumite of Tolfa. The quantity of potash is the same, but three times less than in common (lamellar) and vitreous feldspars. We see however, on comparing the analyses of Klaproth and Vauquelin, that the relative proportions of silica and alumin vary much in different specimens obtained from the mine of Tolfa.

origin do not, however, deposit masses of native alum; to yield which the rocks have need of torrefaction. I know not of any deposits analogous to those I brought from Cumana; for the capillary and fibrous masses found in veins traversing the beds of lignites (banks of the Egra, between Saatz and Commothau in Bohemia *), or effloresceing in cavities (Freienwalde, in Brandenburg; Segario in Sardinia), are impure salts, often destitute of potash, mixed with sulphats of ammonia and magnesia. A slow decomposition of the pyrites, that act perhaps as so many little *galvanic piles*, renders the waters alumiferous, that circulate across the bituminous lignites and carburetted clays †. These waters, in contact with carbonat of lime, even give rise to the deposits of subsulphat of alumin (destitute of potash) which is formed near Halle, and was formerly believed erroneously to be pure alumin, belonging, like the porcelain earth

* *Feder-alaun, haarsalz, mehliger* and *stangliger alaun* of Freienwalde, Tchirning, &c. (*Klaproth, Beitrage*, Tom. i, p. 311; Tom. iii, p. 102, *Ficinus*, in the *Schriften der Dresdener Gesellschaft fuer Mineralogie*, Tom. i, p. 266; Tom. ii, p. 232). From what formation is the native alum drawn, which the Goubanians carry to Syena from the interior of Africa? (*Decade Egypt.* Tom. iii, p. 85). I regret, that I am not able, at a distance from my own collections, to determine the quantity of potash, which the native alum of Robalo contains.

† *Braunkohle* and *Alaunerde.*

(kaolin) of Morl, to porphyry of red sandstone. Analogous chemical actions may take place in primitive and transition slates, as well as in tertiary formations. All slates, and this fact is very important, contain near five per cent of potash, sulphuret of iron, peroxid of iron, carbon, &c. The contact of so many humected heterogeneous substances must necessarily lead them to a change of state and composition. The efflorescent salts, that abundantly cover the aluminous slates of Robalo, indicate how much these chemical effects are favoured by the high temperature of the climate; but, I repeat, in a rock where there are no crevices, no vacuities parallel to the direction and inclination of the strata, native alum, hemidiaphanous and of conchoid fracture, completely filling it's *place* (it's beds), must be regarded as being of the same age with the rock in which it is contained. The term *contemporary formation* is here taken in the sense attached to it by geognosts, in speaking of beds of quartz in *clayslate*, granular limestone in micaslate, or feldspar in gneis.

After having for a long time wandered over barren scenes, amid rocks entirely destitute of vegetation, the eye reposed with pleasure on tufts of malpighia and croton, which we found in descending toward the coast. These arborescent crotons were of two new species *,

* Croton *argyrophyllus*, and c. *marginatus*.

very remarkable for their form, and peculiar to the peninsula of Araya. We arrived too late at the *Laguna chica*, to visit another rock farther east, and celebrated by the name of the Laguna grande, or del Obispo *. We contented ourselves with admiring it from the height of the mountains, that command the view; and, excepting the ports of Ferrol and Acapulco, there is perhaps none of a more extraordinary configuration. It is an inland gulf two miles and a half long from east to west, and one mile broad. The rocks of micaslate, that form the entrance of the port, leave a free passage only two hundred and fifty toises broad. The water is every where from fifteen to twenty-five fathoms deep. It is probable, that the government of Cumana will one day take advantage of the possession of this inland gulf, and of that of Mochima †, eight sea leagues east of the bad road of Nueva Barcelona. The family of Mr. Navarete waited for us with impatience on the beach; and, though our boat carried a large sail, we did not arrive at Maniquarez before night.

We prolonged our stay at Cumana but a

* According to Mr. Fidalgo, lat. 10° 35′, long. 0° 7′ 50″ east of Cumana. See above, vol. iii, p. 21.

† This is a long narrow gulf, three miles from north to south, similar to the *fiords* of Norway. Lat. at the entrance 10° 23′ 45″; long. 10′ west of Cumana, and 3′ west of Puerto Escondido.

fortnight. Having lost all hope of the arrival of a packet from Cumana, we availed ourselves of an American vessel, laden at Nueva Barcelona with salt provision for the Isle of Cuba. We had now passed sixteen months on this coast, and in the interior of Venezuela. Although we had still more than fifty thousand francs left in bills of exchange on the first houses at the Havannah, we should have felt a very distressing want of funds, if the governor of Cumana had not made us all the advances we wished. The delicacy of Mr. d'Emparan's conduct toward strangers, who were entirely unknown to him, claims the highest praise, and the warmest gratitude. I mention these personal incidents, in order to warn travellers not to trust too much to the communications between the different colonies of the same country. In the state of commerce at Cumana and Caraccas in the year 1799, it would have been easier to make use of a draught upon Cadiz or London, than upon Carthagena, the Havannah, or Vera Cruz. We parted from our friends at Cumana on the 16th of November, to make the passage for the third time across the gulf of Cariaco to Nueva Barcelona. The night was cool, and delicious. It was not without emotion, that we saw for the last time the disk of the Moon illuminating the summit of the cocoa-trees, that surround the

banks of the Manzanares. Our eyes remained long fixed on that whitish coast, where once only we had to complain of our fellow men. The breeze was strong, and in less than six hours we anchored near the Morro of Nueva Barcelona, where the vessel which was to take us to the Havannah was ready to set sail.

CHAPTER XXVI.

Political state of the Provinces of Venezuela.—Extent of Territory.—Population.—Natural Productions.—Exterior Commerce.—Communications between the different Provinces, that compose the Republic of Columbia.

Before I quit the coasts of Terra Firma, and point out to the reader the political importance of Cuba, the largest of the West India islands, I shall collect into one point of view whatever may lead to a just appreciation of the future relations of commercial Europe with the United Provinces of Venezuela. In publishing, soon after my return to Germany, the *Essai Politique sur la Nouvelle-Espagne*, I made known at the same time a part of the materials, which I possess on the territorial riches of South America. This comparative view of the population, agriculture, and commerce, of all the Spanish colonies, was formed at a period, when the progress of civilization was shackled by the imperfection of social institutions, the prohibitory system, and

other fatal errors in the science of government. Since I developed the immense resources, which the people of both Americas, enjoying national liberty, might find in their own position and their relations with commercial Europe and Asia, one of those great revolutions, which from time to time agitate the human race, has changed the state of society in the vast regions through which I passed. The continental part of the New World is at present in some sort divided between three nations of European origin; one, the most powerful, is of Germannic race; the two others belong by their language, their literature, and their manners, to Latin Europe. Those parts of the ancient world, which project farthest toward the west, the Iberian Peninsula and the British Islands, are those of which the colonies are most extensive; but four thousand leagues of coast, inhabited solely by the descendants of Spaniards and Portuguese, attest the superiority, which in the fifteenth and sixteenth centuries the peninsular nations had acquired by their maritime expeditions over the navigators of other countries. It may be asserted, that their languages, which are spread from California as far as the Rio de la Plata, and on the back of the Cordilleras as well as in the forests of the Amazon, are monuments of national glory, that will survive every political revolution.

The inhabitants of Spanish and Portuguese

America form together a population twice as numerous as that of English race. The French, Dutch, and Danish possessions of the new continent are of small extent; but, to complete the general view of the nations, which may have an influence on the destiny of the other hemisphere, we ought not to forget the colonies of Scandinavian origin, who are trying to form settlements from the peninsula of Alashka as far as California; and the free Africans of Hayti, who have accomplished the prediction of the Milanese traveller Benzoni in 1545. The situation of the Africans, in an island more than three times as big as Sicily, in the middle of the Mediterranean of the West Indies, augments their political importance. Every friend of humanity prays for the developement of a civilization, which advances in so calm and unexpected a manner. Russian America hitherto less resembles an agricultural colony, than the factories which the Europeans have established on the coast of Africa, to the great misfortune of the natives, presenting only military posts, stations of fishermen, and Siberian hunters. It is no doubt a striking phenomenon, to find the rites of the Greek church established in one part of America; and to see two nations, which inhabit the eastern and western extremities of Europe, the Russians and Spaniards, thus bordering on each other on a continent where they

arrived by opposite ways; but the almost savage state of the unpeopled coasts of Ochotsk and Kamtschatka, the want of resources furnished by the ports of Asia, and the barbarous system hitherto adopted in the Scandinavian colonies of the New World, are shackles that will hold them long in infancy. Hence it follows, that if in the researches of political economy we accustom ourselves to investigate only the mass, we cannot but admit, that the American continent is divided, properly speaking, solely between three great nations, of English, Spanish, and Portuguese race. The first of these three nations, the Angloamericans, is also, next to the English of Europe, that which covers with it's flag the greatest extent of sea. Without any distant colonies, it's commerce has acquired a growth attained in the ancient world by that nation alone, which communicated to North America it's language, the splendor of it's literature, it's love of labour, it's predilection for liberty, and a part of it's civil institutions.

The English and Portuguese colonists have peopled only the coasts opposite to Europe; the Castillians, on the contrary, from the beginning of the conquest, have passed over the chain of the Andes, and made settlements in the most western regions. There only, at Mexico, Cundinamarca, Quito, and Peru, they found traces of ancient civilization, agricultural nations, and

flourishing empires. This circumstance, together with the growth of the native mountain population, the almost exclusive possession of great metallic wealth, and the commercial relations established from the beginning of the sixteenth century with the Indian archipelago, have given a peculiar character to the Spanish possessions in equinoxial America. In the countries of the east, the people who fell into the hands of the English and Portuguese planters were wandering tribes, or hunters. Far from forming a portion of the agricultural and laborious population, as on the table land of Anahuac, at Guatimala, and in Upper Peru, they generally withdrew at the approach of the whites. The necessity of labour, the preference given to the cultivation of the sugar-cane, indigo, and cotton, the cupidity which often accompanies and degrades industry, gave birth to that infamous trade in Negroes, the consequences of which have been alike fatal to both worlds. Happily, in the continental part of Spanish America, the number of African slaves is so inconsiderable, that, compared with the servile population of Brazil, or with that of the southern part of the United States, it is found to be in the proportion of one to fourteen. The whole of the Spanish colonies, without excluding the islands of Cuba and Portorico, have not, on a surface which exceeds at least by a fifth that of

Europe, as many Negroes as the single state of Virginia. The Spanish Americans display in the union of New Spain and Guatimala the sole example in the torrid zone of a nation of eight millions of inhabitants governed according to European institutions and laws, cultivating at the same time sugar, cacao, wheat, and grapes, and having scarcely a slave torn from the land of Africa.

The population of the New Continent yet surpasses but little that of France or Germany. It doubles in the United States in twenty-three or twenty-five years; and at Mexico, even under the government of the mother country, it doubles in forty or forty-five years. Without indulging too flattering hopes of the future, it may be admitted, that in less than a century and a half the population of America will equal that of Europe. This noble rivalship in civilization, and the arts of industry and commerce, far from impoverishing the ancient continent, which has been so often prognosticated, at the expense of the new, will augment the wants of the consumer, the mass of productive labour, and the activity of exchange. No doubt after the great revolutions, which human societies undergo, the public fortune, which is the common patrimony of civilization, is found differently divided among the nations of the two worlds: but by degrees the equilibrium is restored; and it is a fatal, I had

almost said an impious prejudice, to consider the growing prosperity of any other part of our planet as a calamity for ancient Europe. The independance of the colonies will not contribute to isolate them from the old civilized nations, but will rather bring them closer. Commerce tends to unite what a jealous policy has long separated. It may be added, that it is the nature of civilization to go forward, without becoming extinct for this reason in the spot that gave it birth. It's progression from east to west, from Asia to Europe, proves nothing against this axiom. A clear light preserves the same splendor, even when it illumines a wider space. Intellectual cultivation, that fertile source of national wealth, communicates itself from step to step, and extends itself without being displaced. It's movement is not a migration: and if it appear such to us in the east, it is because barbarous hordes have seized upon Egypt, Asia Minor, and that Greece, heretofore free, the forsaken cradle of the civilization of our ancestors.

The barbarism of nations is the consequence of the oppression exercised either by interior despotism, or foreign conquest; and it is always accompanied by a progressive impoverishment, a diminution of the public fortune. Free and powerful institutions, adapted to the interests of all, remove these dangers; and the growing civilization of the world, the rivalship of labour,

and that of trade, are not the ruin of states, the welfare of which flows from a natural source. Productive and commercial Europe will profit from the new order of things in Spanish America, as it would profit by the increase of it's consumption, from events that might put an end to barbarism in Greece, or the northern coast of Africa, and in other countries subjected to the tyranny of the Ottomans. What most menaces the prosperity of the ancient continent is the prolongation of those intestine struggles, which stop production, and diminish at the same time the number and wants of the consumers. This struggle, begun in Spanish America six years after my departure, is drawing gradually to an end. We shall soon see independent nations, ruled by very different forms of government, but united by the remembrance of a common origin, the uniformity of language, and the wants to which civilization gives rise, inhabit the two shores of the Atlantic. It may be said, that the immense progress of the art of navigation has narrowed the basin of the seas. The Atlantic Ocean already appears to us in the form of a narrow channel, which as little removes the New World from the commercial states of Europe, as the basin of the Mediterranean, in the infancy of navigation, removed the Greeks of Peloponnesus from those of Ionia, Sicily, and the Cyrenaïc region.

It appeared to me proper to state these general considerations on the future connection of the two continents, before I traced the political sketch of the provinces of Venezuela, of which I have made known the different races of men, the spontaneous and cultivated productions, the inequalities of the soil, and the interior communications. These provinces, governed till 1810 by a captain general residing at Caraccas, are now united to the ancient viceroyalty of New Grenada, or Santa Fé, by the name of the Republic of Columbia. I shall not anticipate the description, which I must give hereafter of New Grenada; but, in order to render my observations on the statistics of Venezuela more useful to those, who would judge of the political importance of the country, and the advantages it may offer to the trade of Europe, even in it's present little advanced state of cultivation, I shall describe the *United Provinces of Venezuela* in their intimate relations with Cundinamarca, or New Grenada, and as forming part of the new state of Columbia. This sketch will necessarily comprehend five divisions; the extent, population, productions, trade, and public revenue. A part of the statements, which will serve to form this view, having been indicated in the preceding chapters, I shall be concise in noting the general results. Mr. Bonpland and I passed nearly three years in the country, which

now forms the territory of the republic of Columbia; sixteen months in Venezuela, and eighteen in New Grenada. We crossed the territory in it's whole extent; on one hand from the mountains of Paria as far as Emeralda on the Upper Oroonoko, and San Carlo del Rio Negro, situate near the frontiers of Brazil; and on the other, from Rio Sinu and Carthagena as far as the snowy summits of Quito, the port of Guayaquil on the coast of the Pacific ocean, and the banks of the Amazon in the province of Jaen de Bracamoros. So long a stay, and an expedition of one thousand three hundred sea leagues in the interior of the country, of which more than six hundred and fifty were made by water, have furnished me with a pretty exact knowledge of local circumstances. I will not, however, flatter myself with having collected as numerous and certain statistical materials on Venezuela and New Grenada, as those which were afforded me by a much shorter stay in New Spain. We are less induced to discuss questions of political economy in countries merely agricultural, and which present several centres of authority, than where the concentrated civilization of a great capital, and the immense product of mines, accustom men to the commercial estimation of natural wealth. I found in official documents at Mexico and Peru a part of the statements, which I wished to procure. It was otherwise at

Quito, Santa Fé, and Caraccas, where an interest in statistical researches will be developed only through the enjoyment of an independent government. They who are accustomed to examine ciphers before they admit their truth know, that in newly founded free states delight is taken in exaggerating the increase of the public fortune; while in old colonies the list of evils, which are all attributed to the influence of the prohibitory system, is augmented. The people seem to avenge themselves of the mother country, when they exaggerate the stagnation of trade, and the slow progress of population.

I am not ignorant, that travellers, who have recently visited America, regard this progress as far more rapid than the numbers on which I have fixed in my statistical researches seem to indicate. For the year 1913 they promise one hundred and twelve millions of inhabitants in Mexico, of which they believe that the population is doubled every twenty-two years; and for the same epocha one hundred and forty millions in the United States*. These numbers, I confess, do not affright me from the motives, that would alarm the zealous disciples of the system of Malthus. Two or three hundred millions of men may very possibly find subsistence one day in the immense extent of the new continent

* *Robinson's Memoirs on the Mexican Revolution*, Vol. ii, p. 315.

between the lake of Nicaragua and lake Ontario. I admit, that the United States will contain above eighty millions of inhabitants a hundred years hence, allowing a progressive change in the period of doubling from twenty-five to thirty-five and forty years; but, notwithstanding the elements of prosperity to be found in equinoxial America, notwithstanding the wisdom, which I am willing to attribute simultaneously to the new republican governments formed on the south and on the north of the equator, I doubt whether the increase of the population in Venezuela, Spanish Guyana, New Grenada, and Mexico, can be in general so rapid as in the United States. The latter, situate entirely in the temperate zone, destitute of high chains of mountains, offer an immense extent of country of easy cultivation. The hordes of Indian hunters recede before the planters, whom they abhor, and the methodist missionaries, who oppose their taste for indolence and a vagabond life. The more fertile land of Spanish America produces indeed on the same surface a greater bulk of nutritive substances. No doubt on the table lands of the equinoxial region wheat yields annually from twenty to twenty-four for one; but Cordilleras furrowed by almost inaccessible crevices, bare and arid steppes, forests that resist both the axe and fire, and an atmosphere full of venomous insects, will long oppose powerful

obstacles to agriculture and industry. The most enterprising and robust planters cannot advance in the mountainous districts of Merida, Antioquia, and los Pastos, in the llanos of Venezuela and Guaviare, in the forests of Rio Magdalena, the Oroonoko, and the province of las Esmeraldas, west of Quito, as they have extended their agricultural conquests in the woody plains on the west of the Alleghanies, from the sources of the Ohio, the Tennesee, and the Alabama, as far as the banks of the Missoury and the Arkansas. In calling to mind the account of my voyage on the Oroonoko, we may appreciate the obstacles, which the force of nature opposes to the efforts of man in burning and humid climates. In Mexico, large extents of soil are destitute of springs; rains seldom fall, and the want of navigable rivers impedes communication. As the ancient native population is agricultural, and had been so long before the arrival of the Spaniards, the lands of more easy access and cultivation have already their proprietors. Fertile countries of vast extent, at the disposition of the first occupier, or ready to be sold in lots for the profit of the state, are much less common than is imagined in Europe. Hence it follows, that the progress of colonization cannot be every where as free and rapid in Spanish America, as it has been hitherto in the western provinces of the Angloamerican union. The population of

that union is composed wholly of whites, and of Negroes, who, torn from their country, or born in the New World, are become the instruments of the industry of the whites. In Mexico, Guatimala, Quito, and Peru, on the contrary, there exist in our day more than five millions and a half of natives of copper-coloured race, whose isolated position, partly forced and partly voluntary, attachment to ancient habits, and mistrustful inflexibility of character, will long prevent their participation in the progress of the public prosperity, notwithstanding the artifices employed to *disindianize* them.

I dwell on the differences between the free states of temperate and equinoxial America, to show, that the latter have to struggle with obstacles connected with their physical and moral situation; and to remind the reader, that the countries embellished by nature with the most varied and precious productions, are not always susceptible of an easy, rapid, and uniformly extended cultivation. If we investigate the limits, which the population may attain, as depending solely on the quantity of subsistence, that the land can produce, the most simple calculations would prove the preponderance of the communities established in the fine regions of the torrid zone; but political economy, or the positive science of government, distrusts ciphers and vain abstractions. We know, that

by the multiplication of one family only, a continent previously desert may reckon in the space of eight centuries more than eight millions of inhabitants; and yet these estimations, founded on the hypothesis of a *constant doubling* in twenty-five or thirty years, are contradicted by the history of every country already advanced in civilization. The destinies, which await the free states of Spanish America, are too glorious, to stand in need of being embellished by illusions, and chimerical calculations.

AREA AND POPULATION.—To fix the attention of the reader on the political importance of the ancient *Capitania general of Venezuela*, I shall begin by comparing it with the great masses, in which the various nations of the New Continent are now grouped. It is by rising to more general views, that we may hope to throw some interest on the detail of those statistical data, which are the variable elements of national prosperity and power. Among the thirty-four millions of inhabitants spread over the vast surface of *continental America*, in which estimate the savage and native inhabitants are comprised, we distinguish, according to the *three preponderant races*, sixteen millions and a half in the possessions of the *Spanish Americans*, ten millions in those of the *Angloamericans*, and nearly four millions in those of the *Portuguese Americans*. The population of these three great divisions is,

in our days, in the proportion of 4, 2 ½, 1; while the extent of surface, on which the population is spread, is, as the numbers 1·5, 0·7, 1. The *area* of the United States is nearly a fourth greater than that of Russia on the west of the Uralian mountains; and Spanish America is in the same proportion more extensive than the whole of Europe. The United States* contain five eighths of the population of the Spanish possessions, and yet their *area* is not one half so large. Brazil comprehends tracts of country so desert toward the west, that, in an extent only a third less than that of Spanish America, it's population is in the proportion of one to four. The following table contains the results of an attempt, which I made conjointly with Mr. Mathieu, member of the Academy of Sciences and

* To avoid tiresome circumlocutions, I shall continue to designate in this work, notwithstanding the political changes which have taken place in the state of the colonies, the country inhabited by the *Spanish Americans*, by the denomination of *Spanish America*. I call the country of the *Angloamericans* the *United States*, without adding *of North America*, although other *United States* are formed in South America. It is embarrassing to talk of nations, who act a great part on the stage of the world, without having collective names. The term *American* can no longer be applied solely to the citizens of the United States of North America; and it were to be wished, that the nomenclature of the independant nations of the New Continent should be fixed in a manner at once convenient, harmonious, and precise.

of the *Bureau des longitudes*, to estimate by precise methods the extent of the surface of the various states of America. We made use of maps, on which the limits had been corrected, according to the statements published in my *Recueil d' Observations astronomiques*. Our scales were in general sufficiently large, not to neglect spaces from four to five leagues square. We observed this degree of precision, that we might not add the uncertainty of the measure of triangles, trapeziums, and the sinuosities of the coasts, to that of the uncertainty of geographical statements.

GREAT POLITICAL DIVISIONS.	SURFACE in square leagues of 20 to an equinoxial degree.	POPULATION. (1823).
I. Possessions of the Spanish Americans	371,380	16,785000
Mexico or New Spain	75,830	6,800000
Guatimala	16,740	1,600000
Cuba and Portorico	4,430	800000
Columbia { Venezuela	33,700	785000
Columbia { New Grenada and Quito	58,250	2,000000
Peru	41,420	1,400000
Chili	14,240	1,100000
Buenos Ayres	126,770	2,300000
II. Possessions of the Portuguese Americans (Brazil)	256,990	4,000000
III. Possessions of the Anglo-americans (United States)	174,300	10,220000

CHAPTER XXVI.

EXPLANATIONS.

I found the whole extent of South America, taking for the limit the eastern extremity of the Province of Panama, to be 571,290 square leagues; of which the Spanish part, that is Columbia (without the isthmus of Panama and the province of Veragua), Peru, Chili, and Buenos Ayres (without the Magellanic lands), comprise 271,774 square leagues; the Portuguese possessions, 256,990 square leagues; the English, Dutch, and French Guyana, 11,320 square leagues; and the lands of Patagonia, south of Rio Negro, 31,206 square leagues. The following numbers, indicating great extents of surface, may serve as terms of comparison *. Europe, 304,700 square leagues; Russian empire in Europe and Asia, 603,160 square leagues; European part of the Russian empire, 138,116 square leagues; United States of America, 174,310 square leagues. The whole of these estimates are made in square leagues of twenty to an equatorial degree, or 2853 toises. I have adopted this measure in the *Personal Narrative* of my voyage, because nautical leagues, of three miles each, would be more easily adopted uniformly, as a geographical measure, among the commercial nations of Spanish America, than the *leguas legales* and *leguas communes* of Spain, which are twenty-six and a half, and nineteen to a degree. In the *Political Essay on the*

* *See* note B, at the end of the 9th Book.

Kingdom of New Spain, the surfaces are indicated in square leagues of twenty-five to a degree, as they are for the most part in the statistical works published in France. I repeat these statements, because several modern authors, while they have copied the estimates of surfaces contained in the *Political Essay*, have confounded, in their reductions, the leagues of twenty-five to a degree with nautical and geographical leagues; a confusion as lamentable as that of the centigrade and octogesimal scales of the thermometer. By the side of an invariable element, that of the *area*, depending on the degree of precision of the maps which I constructed, I have placed a very uncertain element, that of population. The following statements will throw light on this subject, which may long have been reasonably called *plenum opus aleæ*. In the study of political economy, ciphers, like the elements of meteorology and astronomical tables, can only progressively acquire precision, and we must stop most frequently at *numbers within certain limits*.

A. POPULATION.

Mexico. I believe I have proved in another place from positive data, that the population of the Viceroyalty of New Spain in 1804, including the *provincias internas* and Yucatan, but not the *capitania general* of Guatimala, contained at least 5,840,000 inhabitants, of which 2,500,000 are natives of copper-coloured race; 1,000,000 of Mexican Spaniards, and 75,000 Europeans. I even announced (*Essai politique*, Tom. i, p. 65—76), that the population in 1808 would be nearly 6,500,000, two or three fifths of it, or 3,250,000, being Indians. The intestine wars, which have long agitated the governments of Mexico, Vera Cruz, Valladolid, and Guanaxuato, have no doubt retarded the progress of the annual increase of the Mexican population, which at the time of my stay in the country was probably more than 150,000 (*Essai pol.* tom. i, p. 62—64). The proportion of

births to the population appeared to be one to seventeen; and that of deaths one to thirty. In admitting for eighteen years only an increase of a million of inhabitants, I believe I have estimated high enough the effects of those popular commotions, which have interrupted the working of mines, commerce, and agriculture. Researches made in the country itself have recently proved, that the estimates I formed twelve years ago are not far from the truth. Don Fernando Navarro y Noriega has published at Mexico the results of an extensive inquiry into the number of *curatos y missiones* of Mexico; he estimates the population of the country in 1810 at 6,128,000. (*Catalogo de los curatos que tiene la Nueva España*, 1813, p. 38; and *Rispuesta de un Mexicano al* n° 200 *del Universal*, p. 7). The same author, enabled by his office in the finances (*Contador de los ramos de arbitrios*) to examine the statistic statements on the spot, thinks (*Memoria sobre la poblacion de Nueva España, Mexico* 1814, and *Semanario politico y literario de la Nueva España*, n°. 20, p. 94) that in 1810 the population of New Spain, without including the provinces of Guatimala, was composed of the following elements:

1,097,928 Europeans and American Spaniards.
3,676,281 Indians.
1,338,706 of mixed race.
4,229 secular ecclesiastics.
3,112 ecclesiastics of the regular clergy.
2,098 nuns.

6,122,354

I am inclined to believe, that New Spain has at present nearly seven millions of inhabitants, and this is also the opinion of a respectable prelate, the archbishop of Mexico, don Jose de Fonte, who has travelled through a considerable part of his diocese, and whom I had recently the honour of seeing again at Paris.

Guatimala. This country, which has been hitherto designated as a kingdom, comprises the four bishoprics of Guatimala, Leon de Nicaragua, Chiapa or Ciudad Real, and Comayagua or Honduras. A numbering made in 1778 by the secular government, which was kindly communicated to me by Mr. Del Barrio (deputed to the Cortes of Madrid before the declaration of the independence of Mexico), gave only a population of 797,214 inhabitants; but don Domingo Juarros, the learned author of the *Compendio de la historia de Guatemala*, published successively in 1809—1818, has proved, that this result is very inaccurate (vol. i, p. 9 and 91). The numberings made at the same period by order of the bishops gave above a third more. During my stay at Mexico, the population of Guatimala, where the Indians are extremely numerous, was computed from official documents at 1,200,000; and it is now estimated by persons, to whom the localities are well known, at two millions. Being always desirous of stopping at numbers erring on the deficient side, I have reckoned the population only at 1,600,000.

Cuba and Portorico. The population of the great island of Portorico is little known; it has much increased since the year 1807, when it was computed at 136,000 inhabitants, of which 17,500 were slaves. The census of the island of Cuba gave in 1811, as we have said above, 600,000 inhabitants, of which 212,000 were slaves. (*Documentos de que hasta ahora se compone el expediente sobre los negros de la isla de Cuba*, Madrid, 1817, p. 139.) In another official document much more recent (*Reclamazion hecha por los Representantes de Cuba contra le ley de aranceles*, Madrid, 1821, p. 6), the total population is computed at 630,980 souls.

Columbia. The seven provinces, which heretofore formed the *Capitania general* of Caraccas, had, at the beginning of the 19th century, at the moment when the revolution burst forth, nearly 800,000 inhabitants, according to the ma-

terials which I collected. These materials are not a total enumeration made by the secular power, but partial estimates only, founded partly on the statements of the clergy and missionaries, and partly on considerations of the consumption, and the greater or less advanced state of cultivation. Persons employed in the government of Caraccas, and particularly a man well informed in financial matters, don Manuel Navarete, an officer of the royal treasury at Cumana, assisted me in this task. The period to which it goes up renders it highly interesting. It is a point from which the increase of the population since the acquisition of liberty and independence, may some day be estimated. This increase, we may presume, cannot be felt, till those fine countries are restored to internal tranquillity. Possibly at the time when this work appears, the population may be somewhat less than in 1800. The armies have not been numerous, but they have desolated the best cultivated countries on the coast, and the neighbouring valleys. The earthquake of the 26th of March, 1812 (*See* above, vol. iv, p. 12), the epidemic fevers that prevailed in 1818 (vol. v, p. 761), the arming of the blacks, so imprudently favoured by the royalist party, the emigration of many wealthy families to the West India islands, and a long stagnation of trade, have augmented the public misery.

Provinces of Cumana and Barcelona.....110,000 souls.

I am in possession of a numbering made in 1792, which is at least one sixth in error, and which gives 86,083 souls, of which 42,615 were Indians; namely, 27,787 *de doctrina*, or inhabitants of villages that have a vicar of the secular clergy, and 14,828 *de mission*, or governed by missionary monks. I compute in 1800 for the province of Cumana, or New Andalusia, 60,000: and for the province of Barcelona, 50,000.

Province of Caraccas..... 370,000

The valley of Caucagua and the savannahs of Ocumare were reckoned in 1801, to contain 30,000; the town of Caraccas, and the valleys of Chacao, Petare, Mariches, and los Teques, 60,000; Portocabello, Guayra, and the whole shore from cape Codera as far as Aroa, 25,000; the valleys of Aragua, 52,000; le Tuy, 20,000; the districts of Carora, Barquesimeto, Tocuyo, and Guanare, 54,000; S. Felipe, Nirgua, Aroa and the neighbouring plains, 34,000; the llanos of Calabozo, San Carlos, Araure, and San Juan Baptista del Pao, 40,000. These partial estimates, which comprise almost all the inhabited parts, yield a total of only 315,000.

Province of Coro..... 32,000

Province of Maracaybo (with Merida and Truxillo) 140,000

Province of Varinas..... 75,000

Province of Guayana..... 40,000

A numbering in 1780, the results of which I found in the archives of Angostura (Santo Tomè de la Nueva Guayana), gave 19,616 inhabitants; 1,479 whites, 16,499 Indians, 620 blacks, 1018 *pardos* and *zambos* (people of mixed race).

Island of Margaretta..... 18,000

Total..... 785,000

Perhaps, even at the period at which I stop, the population of the two provinces of Caraccas and Maracaybo, and that of the island of Margaretta (*Brown's Narrative*, 1819, p. 118), were somewhat exaggerated; Mr. Depons, however, who had alike access to the returns made by the vicars to the bishops, estimates the province of Caraccas only, including the province of Varinas, at 500,000 (*Voyage à la Terre Ferme*, tom. i, p. 177). The villages are extremely po-

pulous in the provinces of Maracaybo, both around the lake, and in the mountains of Merida and Truxillo. Among the 780,000, or 800,000 inhabitants, which we may suppose in the *Capitania general* of Caraccas in 1800, there were probably nearly 120,000 Indians of pure race. The official documents * give 25,000 for the province of Cumana (15,000 of them for the missions of Caripe alone); 30,000 for the province of Barcelona (of which 24,700 are in the missions of Piritoo); 34,000 for the province of Guayana (that is, 17,000 in the missions of Carony, 7000 in that of the Oroonoko, and nearly 10,000 living in a state of independance in the Delta of the Oroonoko and in the forests). These statements suffice to prove, that the number of copper-coloured Indians in the *Capitania general* is neither 72,800 nor 280,000, as it has recently been erroneously asserted. (*Depons*, tom. i, p. 178; *Malte-Brun*, *Geogr.*, tom. v, p. 549). The first of these authors, who estimates the total population at only 728,000, instead of 800,000, has singularly exaggerated the number of slaves. He reckons 218,400 (tom. i, p. 241). This number is almost four times too great (*See* above, vol. iii, p. 433). According to partial estimates, made by three persons to whom the localities were well known, don Andres Bello, don Louis Lopez, and don Manuel Palacio Faxardo, in 1812, there existed 62,000 slaves at the utmost, of whom there were

10,000 at Caraccas, Chacao, Petare, Baruta, Mariches, Guarenas, Guatire, Antimano, La Vega, Los Teques, San Pedro, and Budare.

18,000 at Ocumare (las Sabanas), Yare, Santa Lucia, Santa Teresa, Marin, Caucagua, Capaya, Tapipa, Tacarigua, Mamporal, Panaquire, Rio Chico, Guapo, Cupira, and Curiepe.

5,600 at Guayos, San Mateo, Victoria, Cagua, Escobal, Turmero, Maracay, Guacara, Guigue, Valencia, Puerto Cabello, and San Diego.

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* *See* note C., at the end of the 9th Book.

3,000 at Guayra, Choroni, Ocumare, Chuao, and Burburata.
4,000 at San Carlos, Nirgua, San Felipe, Llanos de Barquesimeto, Carora, Tocuyo, Araure, Ospinos, Guanare, Villa de Cura, San Sebastian, and Calabozo.
22,000 at Cumana, Nueva Barcelona, Varinas, Maracaybo, and in Spanish Guyana.

The number of Spanish Americans probably amounts only to 200,000; that of whites born in Europe, to 12,000; whence would result for the whole ancient *Capitania general* of Caraccas, the proportion of 0·51 mixed (mulattoes, zamboes, and mestizes), 0·25 Spanish Americans (creole whites), 0·15 Indians, 0·08 Negroes, and 0·01 Europeans.

With respect to the kingdom of New Grenada, I refer to the numberings of 1778, which gave 747,641 for the audiencia of Santa Fé; and 531,799 for that of Quito. Now, supposing only one seventh omitted, and adding only 0·018 of annual increase, we find in 1800, from the most moderate suppositions, above two millions. Mr. Caldas, well informed of the political state of his native country, reckoned three millions in 1808 (*Semanario de Santa-Fe*, No. 1, p. 2—4). But it is to be feared, that this learned writer greatly exaggerated the number of independent Indians. I find, after mature examination of the materials I possess, the population of the republic of Columbia to be 2,785,000. This estimate is less than that of the president of the congress, who, in the proclamation of the 10th of January, 1820, reckons 3 ½ millions; and it is rather more than that which was officially published in the *Gazeta de Colombia* of the 10th of February, 1822, and which I know only from the journals of Buenos Ayres.

Departments.	Provinces.	Population.
Oroonoko	Cumana	70,000
	Barcelona	44,000
	Guayana	45,000
	Margaretta	15,000
		174,000

Venezuela	Caraccas	350,000
	Varinas	80,000
		430,000
Sulia	Coro	30,000
	Truxillo	33,400
	Merida	50,000
	Maracaybo	48,700
		162,100

These three departments form the ancient *Capitania general* of Caraccas, with a population of 766,100.

Boyaca	Tunja	200,000
	Socorro	150,000
	Pamplona	75,000
	Casanare	19,000
		444,000
Cundinamarca	Bogota	172,000
	Antioquia	104,000
	Mariquita	45,000
	Neiva	50,000
		371,000
Cauca	Popayan	171,000
	Choco	22,000
		193,000
Magdalena	Cartagena	170,000
	Santa Marta	62,000
	Rio Hacha	7,000
		239,000

At the same period (1822), for two provinces of Columbia, the deputies of which were not then arrived at the Congress, were reckoned,

Panama	50,000
Veragua	30,000
	80,000

The departments of Boyaca, Cundinamarca, Cauca, and Magdalena, form, with Panama and Veragua, the ancient *audiencia of Santa-Fe*; that is, New Grenada, without including the *presidencia of Quito*. Total population; 1,327,200.

Ancient *Presidencia* of Quito.	Quito	230,000
	Quixos and Macas.....	35,000
	Cuenca	78,000
	Jaen de Bracamoros	13,000
	Mainas	56,000 (!)
	Loxa	48,000
	Guayaquil	90,000
		550,000

There results from these data of the official Gazette of Columbia, for the three great divisions of the ancient viceroyalty of Santa Fé,

Venezuela.....	766,000
New Grenada	1,327,000
Quito	550,000
	2,643,000

This total estimate nearly accords with that which I had published twelve years before in my *Political Essay on New Spain* (vol. ii, p. 851). It is not founded on an actual numeration, but "on the reports made by the deputies of each province to the congress of Columbia, to settle the law of elections." (*El Argos de Buenos Ayres*, N° 9, Novem-

ber 1822, p. 3, and *Colombia, being a statistical account of that Country*, 1822, vol. i, p. 375). The congress not having been able to consult the deputies of Quito, the population of that *presidencia* has probably been estimated too low. It is given in the official Gazette nearly the same as it was found in 1778, while the estimate of the *audiencia* of Santa Fé gives an increase in 43 years of more than $\frac{70}{100}$. It is to be hoped, that an enumeration made with precision will soon dissipate the doubts we entertain on the statistics of Columbia. It appears to me probable, that, notwithstanding the devastations of war, the population will be found above 2,900,000.

Peru. The estimate of the population indicated in the table is not too high. The works printed at Lima (*Guia politica del Vireynato del Perù parà el año 1793, publicada por la Sociedad academica de los Amantes del pays*) estimated the population, thirty years ago, at a million of inhabitants, of which 600,000 were Indians, 240,000 mestizoes, and 40,000 slaves. The inhabited part of the country has a surface of only 26,220 square leagues; and a large and fertile part of Upper Peru has belonged ever since 1778 to the vice-royalty of Buenos Ayres.

Chili. An enumeration, made in 1813, gave 980,000 souls. Mr. d'Yrisarri, who fills an important office in the government of Chili, thinks, that the population may already have attained 1,200,000.

Buenos Ayres. According to the official documents communicated to Mr. Rodney, one of the commissioners sent by the president of the United States to Rio de la Plata in 1817, the population was two millions. At that period it was found to be 965,000, exclusive of the Indians. The number of natives is extremely considerable in Upper Peru, that is, in the *Provincias de la Sierra*, which belong to the

state of Buenos Ayres. The official returns estimated the Indians alone, in the province of Buenos Ayres, at 130,000; in that of Cordova, at 25,000; in the intendance of Cochabamba, at 371,000; in that of Potosi, at 230,000; and in that of Charcas, at 154,000. The inhabitants of every description (Indians, mestizoes, and whites), in the province of Paz alone, were computed at 400,000.

From these statements it results, that in some districts the returns had included the whole population; and in others the number of whites, mulattoes, and mestizoes only, excluding the natives of copper-coloured race. Now, confining ourselves to the eight provinces of the first description only (namely, Buenos Ayres, Cordova, Cochabamba, Potosi, Charcas, Santa Cruz, la Paz, and Paraguay), we obtain 1,805,000 souls. The provinces and districts of Tucuman, Santiago del Estero, the Valley de Catamarca, Rioja, San Juan, Mendoza, San Luis, Jujuy, and Salta, are wanting in this amount. As they contain, according to other returns, near 330,000 souls, exclusive of the Indians, we cannot doubt, that the total population of the ancient viceroyalty of Buenos Ayres, or la Plata, already comprises two millions and a half of inhabitants of all descriptions. (*Message from the President of the United States at the commencement of the session of the fifteenth Congress*, Washington, 1818, p. 20, 41, and 44). The very particular estimates* obtained by Mr. Brackenridge, secretary to the mission of the United States at Buenos Ayres, and published in a work replete with philosophic views, give to Upper Peru alone, that is, to the four intendencies of Charcas, Potosi, La Paz, and Cochabamba, a population of 1,716,000.

United States. According to the increase hitherto observed, the population of the United States will amount, at

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* *See* note D, at the end of the 9th Book.

the commencement of the year 1823, to 10,220,000, of these 1,623,000 being slaves. It was found in

1700	262,000 (uncertain).
1753	1,046,000 (*idem*, Mr. Pitkin).
1774	2,141,307 (*idem*, Gov. Pownall).
1790	3,929,328 (first certain numbering).
1800	5,306,032.
1810	7,239,903.
1820	9,637,999.

This last enumeration gives 7,862,282 whites; 1,537,568 slaves; and 238,149 free men of colour. According to a very interesting work published by Mr. Harvey (*Edinb. Philos. Journal; January*, 1823, p. 41), the decennial augmentation of the population of the United States was, from 1790 to 1820, successively, 35, 36·1, and 32·9, per cent. The retardation felt in the increase therefore is yet only 2 or 3 per cent for ten years, or one eleventh of the total increase*.

Brazil. It has hitherto been fixed at three millions†; but the estimate which I give in the table is founded on official unpublished pieces, which I owe to the kindness of Mr. Adrien Balbi, of Venice, who was enabled by a long stay at Lisbon, to throw great light on the statistics of Portugal and the Portuguese colonies. According to the report made to the king of Portugal in 1819, on the population of his possessions beyond sea, and according to different statements furnished by the captains general, governors of provinces (conformably to the decrees of Rio Janeiro of the 22d of August and the 30th of September, 1816), Brazil, about the year 1818, had a population of 3,617,900 inhabitants; namely,

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* *See* note E. at the end of the 9th Book.

† *Brakenridge*, Voyage to South America, Vol. i, p. 141.

1,728,000 Negro slaves (*pretos captivos*).
843,000 whites (*brancos*).
426,000 freemen, of mixed blood (*mestissos, mulatos, mamalucos libertos*).
259,400 Indians of different tribes (*Indios de todas as castas*).
202,000 slaves of mixed blood (*mulatos captivos*).
159,000 free blacks (*pretos foros de todas as naçoes africanas*).

3,617,900.

The whole of these returns not having been made at the same period, this state of the population may be considered as relative to the years 1816 and 1818. The population of Brazil, however, must have augmented considerably during the last four or five years. According to documents presented to the house of commons at London in 1821, we see, that the port of Bahia received from January the 1st 1817, to January the 7th 1818, 6070 slaves, and that of Rio Janeiro, 18,032. In the course of the year 1818, the latter port received 19,802 Negroes. (*Report made by a committee to the directors of the African Institution, on the 8th of May*, 1821, p. 37.) I have no doubt, that the population of Brazil is at present more than four millions. It was consequently estimated very high in 1798 (*Essai polit. sur le Mexique*, vol. ii, p. 855.) Mr. Correa de Serra believes, from the ancient returns which he was enabled to examine with care, that the population of Brazil in 1776, was 1,900,000 souls; and the authority of this statesman is of great weight. A table of the population, brought home by Mr. de Saint-Hilaire, correspondent of the Institute, estimates the population of Brazil, in 1820, at 4,396,132; but in this table, as the learned traveller well observes, the number of wild and *catechised* Indians (800,000) and of free men (2,488,743) is singularly exaggerated; while the number of slaves (1,107,389) is much too small. (*See Veloso de Oliveira, Statistique da Brazil*, in the *Annaes Fluminenses de sciencias*, 1822, tom. i, §. 4.)

Having continued during some years to make laborious researches concerning the population of the new states of Spanish America, of the West Indian Islands, and of the wandering Indian tribes in both Americas, I think I may attempt afresh to trace a sketch of the total population of the New World for the year 1823.

I.	Continental America, north of the Isthmus of Panama		19,650,000
	English Canada	550,000	
	United States	10,220,000	
	Mexico and Guatimala	8,400,000	
	Veragua and Panama	80,000	
	Independent Indians, perhaps	400,000	
II.	Insular America		2,473,000
	Hayti (Saint Domingo)	636,000	
	English West India islands	734,500	
	Spanish (exclusive of Margaretta)	800,000	
	French	220,000	
	Dutch, Danish, &c.	82,500	
III.	Continental America, south of the Isthmus of Panama		12,161,000
	Columbia (exclusive of Veragua and Panama)	2,705,000	
	Peru	1,400,000	
	Chili	1,100,000	
	Buenos Ayres	2,300,000	
	English, Dutch, and French Guyana	236,000	
	Brazil	4,000,000	
	Independent Indians, perhaps	420,000	
	Total		34,284,000

The total population of the Archipelago of the West Indies is probably not less than two millions and a half, although the particular distribution of this population amid the different groupes of islands may admit some changes on farther inquiry. These verifications are especially requisite for the free inhabitants of the English islands, the Spanish part of the republic of Hayti, and Portorico.

B. AREA.

It is almost superfluous to relate the precautions, that Mr. Mathieu and myself employed in the calculation of surfaces, either by decomposing the irregular figures of the new states into appropriate trapeziums and triangles, measuring the sinuosities of the exterior limits by means of small squares traced on transparent paper, or rectifying maps on a large scale. Notwithstanding these precautions, operations of this kind may yield very different results; first, because the maps used for this purpose may have been constructed on astronomical data that are not equally precise; secondly, according as the frontiers are traced conformably to the various pretensions of bordering states; thirdly, according as, admitting the legality of the limits, and that they have been astronomically determined with sufficient precision, we exclude from the estimation of the *area* the countries that are *entirely uninhabited*, or occupied by savage nations. It may be conceived, that the first cause chiefly affects the superficial measurement, where the frontiers stretch, as for instance in Peru, along the Cordilleras from north to south. Errors in longitude are known to be in general more frequent and greater than those in latitude; the latter, however, would lead to vary the *area* of the republic of Columbia more than 4600 square leagues, if we were to suppose * as heretofore, on the southern frontier of

* *See* above, vol. v, p. 414., and note F at the end of the 9th Book.

Spanish Güyana and Brazil, the fort of San Carlos del Rio Negro to be situate under the equator; a fort which I found, by the observations made at the rock of Culimacari, to be in 1° 53′ 42″ of north latitude. The second cause of uncertainty, that which relates to political disputes respecting the limits, is of high importance, wherever the Portuguese territory is contiguous to that of the Spanish Americans. The manuscript maps traced at Rio Janeiro or Lisbon have little resemblance with those that are constructed at Buenos-Ayres and Madrid. I have spoken in the 23d Chapter * of the interminable operations attempted by the *commissions of limits*, which have been established during forty years in Paraguay, on the banks of the Caqueta, and in the *Capitania general* of the Rio Negro. The most important points of discussion, according to the study I have made of this great diplomatic controversy, are between the sea † and the river

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* Vol. v, p. 297.

† Since the usurpation of the territory of Montevideo by the Portuguese, the limits between the state of Buenos Ayres and Brazil have undergone great changes in the *eastern banda*, or *Cisplatine* province, that is on the northern bank of the Rio de la Plata, between the mouth of this river, and the left bank of the Uruguay. The coast of Brazil from 30° to 34° of south latitude resembles that of Mexico between Tamiagua, Tampico, and the Rio del Norte. It is formed by narrow peninsulas, behind which great lakes and marshes of salt water are situate (Laguna de los Pathos, Laguna Merim). The two Portuguese and Spanish *marcos* lie toward the southern extremity of the Laguna Merim, into which runs the small river of Tahym (lat. 32° 10′). The plain between Tahym and Chuy was regarded as neutral territory. The little fort of Santa Theresa (lat. 33° 58′ 32″, according to the manuscript map of don Josef Varela) was the most northern post possessed by the Spaniards on the coast of the Atlantic Ocean, south of the equator.

Uruguay, the banks of the Guaray and the Ibicuy, and those of the Iguaçu and the Rio S. Antonio; between the Parana and the Rio Paraguay, the banks of the Chichuy, south-east of the Portuguese fortress of Nova Coimbra *; on the eastern frontiers the Spanish provinces of Chiquitos and Los Moxos, the Banks of the Aguapehy, the Yauru, and the Guapore, a little to the east of the isthmus that separates the tributary streams of the Paraguay and the Rio de la Madeira, near the Villa Bella (lat. 15° 0′); on the south and north of the Amazon, the land completely unknown between the Rio de la Madeira and the Rio Javary (south lat. 10½°—11°); the plains between the Putumayo and the Japura between the Apoporis, which is a tributary stream of the Japura, and the Uaupes, that falls into the Rio Negro †; the forests on the south-west of the mission of Esmeralda, between the Mavaca, Pacimoni, and Cababuri ‡; and finally, the northern part of the Rio Branco and of the Urariquera,

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* Nova Coimbra (lat. 19° 55′) is a *presidio* founded in 1775, and is probably the most southern Portuguese settlement on the Rio Paraguay. In different Spanish and Portuguese maps, the Yaguary (Menici, Monici), a large tributary stream of the Parana, is usually fixed on as the frontier between Parana and Paraguay toward the east; toward the west sometimes the Chichuy (Xexuy) and Ipane, near the ancient mission of Belen (lat. 23° 32′), sometimes the Mboimboy (lat. 20° 27′), opposite the destroyed mission of Itatiny, and sometimes (lat. 19° 35′), the Rio Mondego or Mbotetey, near the destroyed town of Xerez; all three tributary streams of the Paraguay on it's eastern side. The boundary nearest Nova Coimbra, that of Rio Mboymboy, has been pretty generally adopted provisionally between Brazil and the ancient viceroyalty of Buenos Ayres.

† See above, vol. v, p. 334.

‡ Vol. v, p. 475, and p. 558.

between the little Portuguese fort of San Juaquim and the sources of the Rio Carony * (lat. 3° 0′—3° 45′). Some stones (*piedras de marco*) have been placed to mark the limit between Spanish and Portuguese America; and are decorated † with the following pompous inscription: *Pax et Justitia osculatæ sunt. Ex pactis finium regundorum Madridi Idibus Jan.* 1750; but the connexion of these points, very distant from one another, the definitive fixation of the limits, and their solemn recognition, have never been obtained. All that has hitherto been done is regarded only as provisional, and in the meantime the two neighbouring nations, without relinquishing the extension of their rights, maintain a state of peaceable possession. We have mentioned above, that, if a canal of 5,300 toises long ‡ were substituted for the portage of Villa Bella (15 ½°), between the Rio de la Madeira and the Rio Paraguay, an *inland navigation* would be opened between the mouth of the Oroonoko and that of the Rio de la Plata, between Angostura and Montevideo. The course of the great rivers in the direction of the meridians would perhaps afford a *natural boundary* between the

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* Vol. v, p. 481, and p. 789.

† As at the point where the Rio Jauru enters the Paraguay. See the *Patriota de Rio Janeiro*, 1813, N° 2, p. 54.

‡ The portage (*varadoiro*), properly speaking, is between the little rivers Aguapehy and Alegre. The former runs into the Jauru, which is a tributary stream of the Paraguay; the Rio Alegre falls into the Guapore, a tributary stream of the Rio de la Madeira. The sources of the Rio Topayos lie also very near the Villa Bella and the sources of the Paraguay. This country, which forms a *land isthmus* between the basins of the Amazon and the Rio de la Plata, will be one day of the highest importance for the inland trade of South America.

Portuguese and Spanish possessions; a boundry that would accompany the Oroonoko, the Cassiquiare, the Rio Negro, the banks of the Amazon, for a distance of twenty leagues, the Rio de la Madeira, the Guapore, the Aguapehi, the Jauru, the Paraguay, and the Parana, or Rio de la Plata, and would form a line of demarcation of more than eight hundred and sixty leagues. On the east of this boundary the Spanish Americans possess Paraguay, and a part of Spanish Guyana; and on the west, the Portuguese Americans have occupied the country between the Javary and the Rio de la Madeira, and between the Putumayo and the sources of the Rio Negro. It is not from the coasts of Brazil and Peru only, that civilization has advanced toward the central regions; it has penetrated them also by three other roads, the Amazon, the Oroonoko, and the Rio de la Plata; and has ascended the tributary streams of those three rivers and their secondary branches. From the increase of these routes, and their various directions, a configuration of territory and a sinuosity of frontier have resulted, no less difficult to determine astronomically, than disadvantageous to inland trade.

To the two causes of uncertainty in the estimation of surfaces, which we have just analyzed, namely, the errors of astronomical geography, and the discussions of limits, may be added a third, the most important of all. When we speak of the *area* of Peru, or of the ancient *Capitania-general* of Caraccas, it may be doubted whether these names denote only the country in which the Spanish Americans have made settlements, and which consequently depend on their political and religious hierarchy; or whether we should join to the country governed by the whites (by *corregidors*, chiefs of military posts, and missionaries), the forests and savannahs partly desert, and partly inhabited by savages, that is by native and free tribes. We have seen above, that in the interior errors easy to suppose of 1° of latitude, or 2° of

longitude*, may, on frontiers of 300 leagues, enlarge or diminish the surfaces of new states to the extent of 12,000 square leagues; but much more important differences arise from lines of demarcation drawn somewhat arbitrarily between the lands that are regularly inhabited, and those that are desert, or the dwellings of savage tribes. The *limits of civilization* are more difficult to trace than *political limits*. Little missions governed by monks are dispersed along a river; they may be termed the outposts of European civilization, and, ranged in narrow and winding lands, advance

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* I estimate the errors of *relative longitudes* only, for instance, the differences of longitude between the coast, and the valley of the Rio Mamore, or of the Upper Javari. I do not speak of the errors of *absolute longitude*, which sometimes exceed 3° or 4°, without influencing the measure of surfaces. The longitude of the city of Quito ascertained by me (81° 5′ 30″ west of Paris) has caused a considerable change of the western part of America, in the most recent maps. This differs 0° 50′ 30″, from the longitude adopted till my return to Europe (*Connoiss. des Temps pour l'année* 1808, p. 236). The breadth of South America, between Cayenne and Quito, according to d'Anville, is 30 nautical leagues too little. It is the *inequality of partial displacements*, that occasions the errors of *relative longitude* which alter the calculation of the *area*. La Cruz Olmedilla, whose great map has been successively copied and disfigured, placed Santa Fe de Bogota half a degree too far to the east; San Carlos del Rio Negro 2½°; and the mouth of the Apure a quarter of a degree. The distance of Cumana from the mission of Esmeralda on the Upper Oroonoko, is estimated by La Cruz 2¼° too little. In general, before my voyage, the whole system of the rivers Oroonoko and Rio Negro was placed from 1° to 1½° of latitude too far south, and 2° of longitude too far east.

more than a hundred leagues amid forests and deserts. Ought the territory to be considered as Peruvian or Columbian, lying between these solitary villages, these crosses erected by the monks of Saint Francis, and surrounded by a few Indian huts? The hordes that wander on the border of the missions of the Upper Oroonoko, the Carony, the Temi, the Japura, the Mamore, a tributary stream of the Rio de la Madeira, and the Apurimac, a tributary stream of the Ucayale, scarcely know the existence of white men. They are ignorant that the countries, which they have possessed for years, are included, according to the political doctrines of *closed territory* (*territoire fermé*), within the limits of the states of Venezuela, New Grenada, and Peru.

In the present state of things, there is a *contiguity of cultivated lands*, or rather a *contiguity of Christian settlements* only, on a very small number of points. Brazil touches Venezuela only by the band of the missions of the Rio Negro, Cassiquiare, and Oroonoko; and Peru only by the missions of the Upper Oroonoko, and those of the province of Maynas, between Loreto and Tabatinga. The different states in the New World are connected only by narrow slips of cleared lands. Between the Rio Branco and the Rio Carony, the Javary and the Guallaga, the Mamoré and the mountains of Cusco, lands inhabited by savages, and which have never been traversed by whites, separate, like arms of inland seas, the civilized parts of Venezuela, Brazil, and Peru. (Compare above, Chap. xii, Vol. iii, p. 431—427.) European civilization is spread as in divergent rays from the coast, or the high mountains near the coast, toward the centre of South America; and the influence of governments diminish in proportion to the distance from the shore. Missions entirely dependent on monastic power, inhabited only by the race of copper-coloured natives, form a vast zone around regions more anciently cleared; and these Christian settlements are placed on the borders of savannahs and

forests, between the agricultural and pastoral life of the colonists, and the wandering life of hunting tribes. In maps constructed at Lima, the territory of the most eastern Peruvian intendances (Tarma and Couzco) frequently is not extended so far as the frontiers of Grand Para and Mattogrosso; those parts only that are subject to the whites (*terras conquistadas*) being called Peru, and the rest are marked by the vague denominations of unknown land, Indian countries, savage countries (*paises desconocidos, comarca desierta, tierras de Indios bravos y infieles*). The whole of Peru, extending it as far as the Portuguese limits, is 41,420 square nautical leagues, while, if we abstract the wild and unknown countries between the frontiers of Brazil and the eastern banks of the Beni and the Ucayale, we find only 26,220 square leagues. We shall soon see, that, in the ancient viceroyalty of Buenos Ayres, now called the *United States of the Rio de la Plata*, the difference is still greater. In the same manner we may compute Brazil at 257,000 or 118,000 square leagues, according as we calculate the whole surface of the country from the coast to the banks of the Mamoré and Javary, or stop at the course of the rivers Parana and Araguay, excluding from the area of Brazil the greater part of the provinces of Mattogrosso, Rio Negro, and Portuguese Guyana, three unpeopled provinces, comprising more than a third of the extent of Europe.

From these considerations we must not be surprised, if geographers, who calculated the surfaces with an equal precision, and according to pretty good maps, found, that the results differed a quarter, a third, and sometimes even more than half. It is not easy to fix the limits of desert regions, or those inhabited by independent natives; the missions advance amid these savage countries, following the beds of the rivers. The calculated surfaces vary according as we estimate the territory only which the missionaries have acquired, or add the forests interposed between their acquisitions. Thus the want of conformity observable between

the preceding table, and that calculated by Mr. Oltmanns in 1806, results only from *the exclusion of the countries not submitted to the governance of the whites.* The ancient estimates are all necessarily less than the new, which present the total area. In reducing common leagues to nautical leagues, I reckoned in the *Essai politique sur la Nouvelle-Espagne* (Tom. ii, p. 851) 299,810 square leagues (twenty to a degree) for the whole of Spanish America; 30,628 for Venezuela, or the ancient *capitania general* of Caraccas; 41,291 square leagues for New Grenada; 19,449 for inhabited Peru (according to the frontiers indicated in the *Map of Intendancies*, published at Lima in 1792, by Don Andrew Baleato); 14,447 square leagues for Chili; and 91,528, for the United Provinces of Rio de la Plata, or the ancient viceroyalty of Buenos Ayres. What I have just stated on the calculations of the surfaces of Spanish America, and the causes from which these calculations vary, may be equally applied to the territory of the United States, which on the west has been terminated at different periods by the Mississipi, the stony Mountains, and the coast of the Pacific Ocean. The *territory of Missouri*, and that of *Arkansas*, have been long in some sort without frontiers toward the west; they resemble in this point of view the province of the Chiquitos of South America. In the following tables I have adopted a different method of calculation from that which I had hitherto observed; I have estimated the extent of land, which the increasing population of each state will fill in the lapse of ages. The lines of division (*lineas divisorias*) adopted are such as they are found according to received traditions, and the rights acquired by long and peaceable possession, on the manuscript Spanish and Portuguese maps in my collection. Where the maps of the two nations differed considerably, these differences have been attended to, and the medium taken as the results. The numbers on which I have fixed in the preceding table consequently indicate the *maximum* of surface furnished to the

industry of the states of Columbia *, Peru, and Brazil; but as the political strength of states at a given period depends less on the proportion of their total extent to the number of their inhabitants, than on the degree of concentration of the greater part of the population, I have estimated the inhabited and uninhabited parts separately. I have less hesitated in adopting this method, because some respectable persons in the new governments established in Spanish America have wished, for the benefit of their internal administration, to know at the same time the total and the partial surfaces. The denomination of provinces will probably undergo frequent changes, as is the case in all societies recently formed. Different combinations are tried, before a state of equilibrium and stability is attained; and if innovations of this kind have been less frequent in the United States, we must not attribute this to the national character alone, but to that happy situation of the Angloamerican colonies, which, governed from their origin by excellent political institutions, possessed liberty previous to independence.

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* In the declaration of the congress of Venezuela, of the date of December 17th, 1819, a declaration which is regarded as the *fundamental law* of the republic of Columbia, the territory is estimated (article 2) at 115,000 square leagues, without adding the value of these leagues. If they be nautical leagues, which is very probable, the estimate is 25,000 leagues too great (once and a half the *area* of France). Maps must have been consulted, which were not corrected according to the astronomical observations made at the southern and eastern frontiers. All the estimates of *area* hitherto published in the new states of America are very inexact. I except the partial statements of the *Abeja argentina* (1822, N° i, p. 8), an interesting journal published at Buenos Ayres.

New Spain. The surface of this vast country has been calculated with great care by Mr. Oltmanns, according to the limits marked on my large map of Mexico. There will soon probably be some changes on the north of San Francisco and beyond the Rio del Norte, between the mouth of the Rio Sabina and that of the Rio Colorado de Texas. The assertions made on my map of Mexico, drawn in 1804, and published in 1809, relative to the identity of the Rio Napestle and the Rio de Pecos, with the rivers which bear the names of Arkansas, and the Red River of the Natchitotches in Louisiana, have been fully justified by the journey of major Pike, which appeared at Philadelphia in 1810.

Guatimala. This country, so little known, contains the provinces of Chiapa, Guatimala, Vera Paz or Tezulutlan, Honduras (towns: Comayagua, Omoa, and Truxillo), Nicaragua, and Costa Rica *. The coast of Guatimala extends on the south sea from Barra de Tonalà (lat. 16° 7′, long. 96° 39′), on the east of Tchuantepec, to la Punta de Burica or Boruca (lat. 8° 5′, long. 85° 13′), on the east of the Golfo Dulce de Costa Rica. From this point, the frontier ascends successively to the north, stretching along the Columbian province of Veragua, toward Cape Careta, (lat. 9° 35′, long. 84° 43′), which advances into the Caribbean sea a little to the west of the fine port of Bocca del Torro; to the N.N.W. along the coast, as far as the river Bluefields, or Nueva Segovia (lat. 11° 54′, long. 85° 25′), in the territory of the Moschetto Indians; toward the N.W., along the river Nueva Segovia for forty leagues; and finally, to the N. at Cape Camaron (lat. 16° 3′, long. 87° 31′) between Cape Gracias a Dios and the port of Truxillo. From Cape

* *Juarros, Compendio de la Hist. de Guatemala,* printed at Guatimala, 1809, vol. i, p. 5, 9, 31, 56; vol. ii, p. 39. *Jose Cecilio Valle, Periodico de la Sociedad economica de Guatemala,* vol. i, p. 38.

Camaron the coast of Honduras, stretching W. and N., forms the frontier as far as the mouth of the river Sibun (lat. 17° 12′, long. 90° 40′). Thence, this frontier follows the course of the Sibun to the E., crosses the Rio Sumasinta, which runs into the Laguna de Terminos, stretches toward the Rio de Tabasco or Grixalva, as far as the mountains that command the Indian town of Chiapa, and turns to the S.W., to rejoin the coasts of the South Sea at la Barra de Tonala.

Cuba and Portorico. The *area* for Portorico is calculated from the maps of the Hydrographic Depot at Madrid; for the island of Cuba, from the map, which I constructed in 1820, from my own astronomical observations, and from the whole of the data hitherto published by Messrs. Ferrer, Robredo, Lemaur, Galiano, and Bauza.

Columbia. The following are the actual limits of the republic of Columbia, according to the information which I obtained on the spot, particularly at the southern and western extremities; that is at Rio Negro, Quito, and in the province of Jaen de Bracamoros. Northern coast, that of the Caribbean sea, from Punta Careta (lat. 9° 36′, long. 84° 43′), on the eastern frontier of the province of Costa Rica (belonging to the state of Guatimala), to the rivers Moroco and Pamaroun *, east of Cape Nassau. From this

* See above, vol. v, p. 753—5. Great uncertainty still prevails respecting the situation of this point, the most eastern of the territory of Columbia. A farther reason for the longitudes being ill determined between the mouth of the Oroonoko and English Guyana is, that they have not been connected together by chronometric means. The mouth of the Rio Pomaroun, or Poumaron depends on the position both of the Punta Barima and of the Rio Essequebo (Esquivo). Now, Cape Barima is half a degree too far to the

point of the coast (lat. 7° 35′, long. 61° 5′ ?), the frontier of Columbia stretches across the savannahs, in which some little granitic rocks stand prominent, first S. W., and then S. E., toward the confluence of the Rio Cuyuni with the

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east on the great map of South America published by Mr. Arrowsmith. This geographer indicates with sufficient precision Puerto Espana, in the island of Trinidad (65° 50′); but he makes the difference of longitude between Puerto Espana and Punta Barima to be 1° 52′, while it is only 1° 31′, as determined with great precision by the operations of Churruca (See above, vol. v, p. 718, and *Espinosa Memorias de los Navegantes Espanoles*, Vol. i, N° 4, p. 80—82). The south-east bank of the mouth of the Oroonoko is in 8° 40′ 35″ latitude, and 62° 23′ longitude. If we determine the mouth of the Rio Essequebo by the difference of longitude from Cape Barima generally adopted (1° 22′—1° 30′), we shall find the Essequebo to be about 60° 53′. This is nearly the position fixed on by Mr. Buache, in his map of Guyana (1797), which indicates the longitude of Cape Barima (62° 28′) very well also. Several geographers, captain Tuckey for instance (*Maritime Geography*, Vol. v, p. 733), believes the middle of the mouth of the Essequebo to be in 60° 32′—60° 41′; and it is probable, that the mouth of this river has been compared with the position of Surinam, or that of Stabrook, the flourishing capital of Demerary. The reckoning on this coast, however, where the current sets strongly to the N. W., tends to diminish the differences of longitude in sailing from Cayenne to Cape Barima, and to the island of Trinidad. The longitude of the mouth of the little river of Moroco, situate near that of Pomaroun, and serving as the frontier between the English colony of Guyana and the territory of Columbia, depends on the longitude of the Rio Essequebo, from which it is 45′ distant, according to Bolingbroke, toward the west, and from 30′ to

Masuruni, where formerly a Dutch post was established * opposite the Cano Tupuro. Crossing the Masuruni, the boundary runs along the western banks of the Essequebo and Rupunuri, as far as the point where the Cordillera of Pacaraimo (4° of north latitude) gives a passage to the Rio Rupunuri, which is a tributary stream of the Essequebo; then, following the southern declivity of the cordillera of Pacaraimo, which separates the waters of Caroni from those of the Rio Branco, it goes successively toward the west, by Santa Rosa (nearly lat. 3° 45′, long. 65° 20′), to the sources of the Oroonoko, lat. 3° 40′, long. 66° 10′?); toward the S. W., to the sources of the Rio Mavaca and the Idapa (lat. 2°, long. 68°), and, crossing the Rio Negro at the island of San Jose (lat. 1° 38′, long. 69° 58′) near S. Carlos del Rio Negro; toward W. S. W., through plains entirely unknown, to the *Gran Salto del Yapura*, or Caqueta, situate near the mouth of the Rio de los Enganos (south lat. 0° 35′); and finally makes an extraordinary turn toward the S. E. at the confluence of the Rio Yaguas with the Putumayo, or Içа (south lat. 3° 5′); the point where the Spanish and

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35′, according to other maps recently published. A manuscript map of the mouths of the Oroonoko in my possession gives but 25′. It results from these minute discussions, that the longitude of the mouth of the Pomaroun is between 60° 55′ and 61° 20′. I here reiterate the wish I have already expressed in another place, that the government of Columbia may connect chronometrically, and by an uninterrupted navigation, the mouth of the Essequebo, Cape Nassau, Punta Barima (Old Guyana and Angostura), the *bocas chicas* of the Oroonoko, Puerta Espana, and Punta Galera, which is the north-east cape of the island of Trinidad.

* We must not confound this post with the ancient Spanish post *destacamento de Cuyuni*), on the right branch of the Cuyuni, at the confluence of the Curumu.

Portuguese missions of the lower Putumayo come into contact. From this point the frontier of Columbia goes toward the south, crossing the Amazon near the mouth of the Javary, between Loreto and Tabatinga, and stretching along the eastern bank of the Rio Javari, as far as 2° distant from it's confluence with the Amazon; to the W., crossing the Ucayale and the Rio Guallaga, the latter between the villages of Yurimaguas and Lamas (in the province of Maynas, 1° 25′ south of the confluence of the Guallaga with the Amazon); to the W. N. W., crossing the Rio Utcubamba, near Bagua Chica, opposite Tomependa. From Bagua the frontier stretches S. S. W., toward a point of the Amazon (lat. 6° 3′) situate between the villages of Choros and Cumba, between Collac and Cuxillo, a little below the mouth of the Rio Yaucan; it then turns westward, crossing the Rio de Chota, toward the Cordillera of the Andes, near Querocotillo, and to the N. N. W., stretching along and passing over the cordillera between Landaguate and Pucara, Guancabamba and Tabaconas, Ayavaca and Gonzanama (lat. 4° 13′, long. 81° 53′), to reach the mouth of the Rio Tumbez (lat. 3° 23′, long. 82° 47′). The coast of the Pacific Ocean bounds the territory of Columbia for 11° of latitude, as far as the western extremity of the province of Veragua, or Cape Burica (N. lat. 8° 5′, long. 83° 18′; from this cape the frontier runs toward the north (across the enlarged isthmus which forms the continent between Costa Rica and Veragua), and rejoins the Punta Careta on the coast of the Caribbean Sea, west of the lake of Chiriqui, whence we departed to make the tour of this immense territory of the republic of Columbia.

These indications may serve to rectify the maps, even the most modern of which, published under the auspices of Mr. Zea, and said to be constructed from the materials I had collected *, traces vaguely the state of a long and

* Columbia, from Humboldt and other recent authorities, London, 1823.

peaceful possession between bordering nations. It is customary to consider the whole southern bank of the Japura as Spanish, from the Salto Grande as far as the inland delta of the Abatiparana, where, on the northern bank of the Amazon, a *marco de limites* is placed, a stone which the Portuguese astronomers found in lat. 2° 20′, and long. 69° 32′. (*Manuscript Map of the Amazon, by Don Francisco Requena*, commissary of limits to his Catholic Majesty, 1783.) The Spanish missions of Japura or Caqueta, commonly called *missions des Andaquies*, extend no farther than Rio Caguan, a tributary stream of the Japura, below the destroyed mission of S. Francisco Solano. All the west of the Japura, south of the equator, from the Rio de los Enganos and the Great Cataract, is in the possession of the natives and the Portuguese. The latter have some small settlements at Tabocas, S. Juaquin de Cuerana, and Curatus; the second of which is on the south of the Japura, the third on it's northern tributary stream, the Apoporis *. According to the Portuguese astronomers, it was at the mouth of the Apoporis, in lat. 1° 14′ south, long. 17° 58′, (west of the meridian of Paris), that the Spanish commissioners were willing to place the stone of the limits in 1780, which denoted an intention of not preserving the *marco* of Abatiparana. The Portuguese commissaries opposed taking the Apoporis for the frontier, asserting, that, in order to cover the Brazilian possessions on the Rio Negro, the new *marco* ought to be placed at the *Salto Grande del Japura* (south lat. 0° 33′, long. 75° 0′). In Putumayo or Iça, the most southern Spanish missions (*missiones baxas*), governed by the ecclesiastics of Popayan and Pasto, do not extend as far as the confluence of the Amazon, but only to 2° 20′ of south latitude, where the small villages of Marive, S. Ramon, and Asumpcion, are situate. The Portuguese are masters

* See above, Vol. v, p. 336—339.

of the mouth of the Putumayo; and, to reach the missions of Baxo Putumayo, the monks of Pasto are obliged to go down the Amazon to Pevas, below the mouth of the Napo; to proceed from Pevas to the north by land, as far as *Quebrada*, or *Caño* de Yaguas, and enter the Rio Putumayo by this Caño. Neither can the left bank of the Amazon, from Abatiparana (long. 69° 32′) to Pongo de Manseriche, at the western extremity of the province of Maynas, be considered as the boundary of New Grenada. The Portuguese have always had possession of both banks as far as to the east of Loreto (long. 71° 54′); and the situation of Tabatinga, on the north of the Amazon, where the last Portuguese post is placed, sufficiently proves, that the left bank of the Amazon, between the mouth of the Abatiparana and the frontier near Loreto, was never considered by them as belonging to the Spanish territory. To prove likewise, that the southern bank of the Amazon does not form the boundary with Peru from the mouth of the Javari toward the west, I have but to mention the existence of the numerous villages of the province of Maynas, situate on the Guallaga, as far as beyond Yurimaguas, 28 leagues south of the Amazon. The extraordinary sinuosity of the frontier, between the Upper Rio Negro and the Amazon, arises from the circumstance, that the Portuguese introduced themselves into the Rio Yapurá by going up toward the N. W., while the Spaniards descended the Putumayo. From the Javari, the Peruvian limit goes beyond the Amazon, because the missionaries of Jaen and Maynas, coming from New Grenada, penetrated into these almost savage regions by the Chinchipe and the Rio Guallaga.

Calculating the surface of the Republic of Columbia, according to the limits we have just traced, we find 91,952 square leagues (20 to a degree) thus:

POLITICAL DIVISIONS.	Square Leagues.	Square Leagues.
1. *Venezuela*	.....	33,701
New Andalusia or Cumana	1,299	
New Barcelona	1,564	
Delta of the Oroonoko	652	
Spanish Guayana	18,793	
Caraccas	5,140	
Varinas	2,678	
Maracaybo	3,548	
Island of Margaretta (excluding the Laguna)	27	
II. *New Grenada* (with Quito) ...	.....	58,251
REPUBLIC OF COLUMBIA	.....	91,952

Whatever changes the territorial divisions of Venezuela may yet undergo, whether from the variable wants of the internal administration, or the desire of innovation, always so active at the period of a political regeneration, the exact knowledge of the *area* of the ancient provinces will serve to estimate approximately the *area* of the new. On considering attentively the divisions made for ten years past, we perceive, that, in the different attempts to *reconstruct societies*, the same elements are combined, till a stable equilibrium is found.

Partial Limits:

A.) ANCIENT CAPITANIA GENERAL OF CARACCAS:

a.) GOVIERNO DE CUMANA, comprising the two provinces of New Andalusia and Barcelona, a little less than the state of Pensylvania, which contains 46,000 square miles (69·2 to a degree). The limit on the south and south-east is formed by the course of the Lower Oroonoko, as far as it's principal

mouth * (*boca de Navios*); on the north, by the coasts of the Atlantic Ocean and the Caribbean Sea, from long. 26° 23′ as far as the mouth of the Rio Unare, (long. 62° 33′). From the mouth of this river towards the south, the limit between the provinces of Caraccas and Barcelona first follows the Unare towards it's origin in the hilly country west of the village of Pariaguan, and then stretches to the Oroonoko, between the mouth of the Rio Suata and that of the Rio Caura, 24′ east of Alta Gracia, called Ciudad Real in the old maps. I fixed in my calculations this point of the longitude of the Oroonoko by deducing it from the longitude of the Rio Caura. It is nearly 68_0 3′ west of the meridian of Paris. Other geographers, Lopez for instance, in his map of the province of Caraccas, makes the limit proceed to the Raudal de Camiseta, eight leagues east of the Rio Caura. In a manuscript map, which I copied in the archives of Cumana, the frontier is marked near Muitaco, at the mouth of the Rio Cabrutica, three leagues east of the Rio Pao. The governors of Cumana long pretended to extend their jurisdiction much beyond the mouth of the Rio Unare, as far as the Rio Tuy, and even as far as Cape Codera†. According to this supposition they draw a line toward the south, 15 leagues east of Calabozo, between the sources of the Rio Uritucu and those of the Rio Manapire, following the latter river as far as it's confluence with the Oroonoko, four leagues to the east of Cabruta ‡. This, the most western limit, would add an extent of 400 square leagues to the province

* *See* above, vol. v, p. 717 and 724. I have, however, calculated separately the almost uninhabited delta of the Oroonoko, between the principal branch and the Manamo Grande, the westernmost of the *bocas chicas*. This marshy delta is three times the average extent of a department of France.

† Vol. iii, p. 370. ‡ Vol. v, p. 680.

of Barcelona, containing the *Valle de la Pasqua*, which La Cruz and Caulin mark on their maps by the words, *terreno que disputan las dos provincias de Barcelona y de Caracas*. In my estimation of the *area* I followed the frontier of the Rio Unare, because it determines the *present state of possession* between the neighbouring provinces. The *Govierno de Cumana* contains four *ciudades* (Cumana, Cariaco, Cumanacoa, Nueva-Barcelona) and four *villas* (Aragua, La Concepcion del Pao, La Merced, and Carupano)*. New cities will probably arise on the shores of the gulf of Paria (*Golfo triste*), as well as on the banks of the Areo and the Guarapiche; since these points offer great advantages to the commercial industry of New Andalusia.

b.) Spanish Guayana; such as it was administered before the revolution of the 5th of July, 1811, by a governor resident at Angostura (Santo Tomè de la Nueva Guayana.) It contains more than 225,000 English square miles, and consequently exceeds the *area* of all the *Atlantic Slave States*, Maryland, Virginia, the two Carolinas, and Georgia. More than nine-tenths of this province are uncultivated, and almost uninhabited. The limits on the east and south, from the principal mouth of the Oroonoko to the island of San Jose de Rio Negro, have been indicated in describing the general configuration of the republic of Columbia. The limits of Spanish Guayana on the north and west are, first the Oroonoko, from Cape Barima to San Fernando de Atabapo, and then a line stretching from north to south, from

* Vol. ii, p. 183—214; Vol. iii, p. 7, 51—67, 159—206, 361; and the present vol. p. 45. I am ignorant of the real position of the Villa de la Merced, indicated in the manuscript map of the archives of Cumana. Piratoo and Manapire appear also to pretend to the title of *villas*. (Caulin, p. 190.)

San Fernando towards a point 15 leagues west of the little fort of San Carlos. The line crosses the Rio Negro a little above Maroa *. The north-east frontier, that of the English Guayana, merits the greatest attention, on account of the political importance of the mouths of the Oroonoko, which I have discussed in the 24th chapter of this work. The sugar and cotton plantations had already reached beyond the Rio Pomaroun under the Dutch government; they extend farther than the mouth of the little river Moroco, where a military fort is established. (*See* the very interesting map of the colonies of *Essequebo and Demerara*, published by Major F. de Bouchenroeder, in 1798). The Dutch, far from recognizing the Rio Pomaroun, or the Moroco, as the limit of their territory, placed the boundary at Rio Barima, consequently near the mouth of the Oroonoko itself; whence they draw a line of demarkation from N. N. W. to S. S. E. towards Cuyuni. They had even taken military occupation of the eastern bank of the small Rio Barima, before the English (in 1666) had destroyed the forts of New Zealand and New Meddelburgh on the right bank of Pomaroun. Those forts, and that of Kyk-over-al, (*look every where around*), at the confluence of the Cuyuni, Masaruni, and Essequebo, have not been re-established. Persons, who had been on the spot, assured me, during my stay at Angostura, that the country west of Pomaroun, of which the possession will one day be contested by England and the republic of Columbia, is marshy, but exceedingly fertile. The towns of Guyana, or rather the places which have the privileges † of *villas* and *ciudades*, are Angostura, Barcceloneta, Upata, Guirior (merely a military post at the confluence of the Paraguamusi and the Paragua, a tributary stream of the Caroni), Borbon, Real Corona or Muitaco, La Piedra, Alta Gracia, Caycara, San

* *See* above, vol. v, p. 195—223, 355, 364, 415.

† Vol. v, p. 679.

Fernando del Atabapo, and Esmeralda (some indian huts around a church).

c.) Province of Caraccas; 61,000 English square miles, consequently about one-seventh less than the state of Virginia. Northern limit: the Caribbean sea from the mouth of the Rio Unare, long. 67° 39′, to the other side of the Rio Maticores (long. 73° 10′) in the direction of the gulf or *Saco* of Maracaybo, on the east of Castillo de San Carlos. Western limit: a line directed towards the south, between the mouth of the Rio Motatan and the town of Carora, by the sources of the Rio Tocuyo and the Paramo de las Rosas*, between Bocono and Guanare; towards the E. S. E., between the Portuguesa and the Rio Guanare or the Caño de Ygues, a tributary stream of the Portuguesa: this line forms the frontier of the provinces of Varinas and Caraccas; and runs on the S. E. between San Jaime and Uritucu, towards a point of the left bank of the Rio Apure, opposite San Fernando. Southern limit: first the Rio Apure, from lat. 7° 54′ long. 70° 20′, to its confluence with the Oronooko, near Capuchino (lat. 7° 37′ long. 69° 6′); then, the Lower-Oroonoko towards the east, as far as the western frontier of Govierno de Cumana, near the Rio Suata, on the east of Alta Gracia. Towns: Caraccas, La Guayra, Portocabello, Coro, Nueva Valencia, Nirgua, San Felipe, Barquesimeto, Tocuyo, Araure, Ospinos, Guanare, San Carlos, San Sebastian, Villa de Cura, Calabozo, and San Juan Baptista del Pao.

d.) Province of Varinas, comprising an *area* of 32,000 English square miles, rather less than the state of Kentucky. Eastern limit: from the southern extremity of Paramo de las Rosas, and the sources of the Rio Guanare, toward the

* *See* my Geog. Atlas, pl. 17.

S. E. to the Caño de Yguos; thence between the Rio Portuguesa and the Rio Guarico, towards the E. S. E., to the mouth of the Apure; and to the southward along the left bank of the Oroonoko, from the 7° 36′ S. lat. as far as the mouth of the Meta. Southern limit: the northern bank of the Meta, as far as Las Rochellas de Chiricoas, between the mouths of the Caño Lindero and the Macachare (the long. perhaps 70° 45′). Western limit: first, from the left bank of the Meta, to the N. W. across the plains of Cassanare, between Guardualito and the Villa de Arauca, then, to the N. N. W. above Quintero and the mouth of the Rio Nula, which joins the Apure after the Rio Orivante, toward the sources of the Rio Canagua, and the foot of the Paramo de Porquera. Northern limit: the south-east declivity of the Cordillera de Merida, from the Paramo de Porquera, between La Grita and Pedraza, as far as the ravine of Lavellaca, in the road of Los Callejones, between Varinas de Merida and the sources of the Rio Guanare, situate N. N. W. of Bocono. Cities: Varinas, Obispos, Bocono, Guanarito, San Jaime, San Fernando de Apure, Mijagual, Guardualito, and Pedraza. By comparing my map of the province of Varinas with the maps of La Cruz, Lopez, and Arrowsmith, it will be perceived what confusion has hitherto prevailed in the labyrinth of rivers that form the tributary streams of the Apure and the Oroonoko.

e.) *Province of Maracaybo*, (together with Truxillo and Merida) comprising 42,500 English square miles, of rather less extent than the state of New York. Northern limit: the shore of the Caribbean Sea, from the Caño de Oribono (to the westward of the Rio Maticores) as far as the mouth of the Rio Calancala, a little to the eastward of the great river del Hacha. Western limit: a line first stretching from the coast to the southward, between the Villa de Reyes, called also Valle de Upar, and the small group of mountains (Sierra de Perija) that rise on the west of the

lake of Maracaybo, towards the Rio Catatumbo; then to the eastward of Salazar to the Rio Sulia, a little above San Faustino; and finally on the east, to the Paramo of Porquera, situate to the N. E. of La Grita. The southern and eastern limits stretch to the southward of the snowy mountains of Merida, across the ravine of Lavellaca, at the eastern foot of Paramo de las Rosas, toward the sources of the Rio de Tocuyo, and thence, between the mouth of the Rio de Motatan and the town of Carora, towards the Caño Oribono, as we have just stated, in describing the boundaries of the provinces of Varinas and Caraccas. The most western part of the *Govierno* of Maracaybo, which comprehends Cape la Vela, is called the *Provincia de los Guajiros* (Guahiros), on account of the wild Indians of that name by whom it is inhabited, from the Rio Socuyo, as far as the Rio Calancala. The independent tribe of the Cocinas is found toward the south. Towns: Maracaybo, Gibraltar, Truxillo, Merida, San Faustino.

B.) Ancient Viceroyalty of New Grenada,

comprehending New Grenada, properly so called, (Cundinamarca) and Quito. The western limits of the provinces of Maracaybo, Varinas, and Guayana, bound the territory of the viceroyalty on the east: the frontiers on the south and west are those of Peru and Guatimala. We shall only add here, in order to rectify the errors of the maps, that the Valle de Upar, or Villa de Reyes, Salazar de las Palmas, El Rosario de Cucuta, celebrated as the residence of the constituent assembly of Columbia, in the month of August 1816, San Antonio de Cucuta, la Grita, San Christoval, and la Villa de Arauca; as also the confluence of the Casanare and the Meta, the Inirida and the Gaviare, belong to New Grenada. The province of Casanare, dependent on Santa Fe de Bogota, extends towards the north beyond the Ori-

vante. On the north-east, the easternmost province of New Grenada, called *Provincia del Rio Hacha*, is separated by the Rio Enea from the province of Santa Marta. In 1814 the Rio Guaytara divided the province of Popayan from the presidency of Quito, to which belonged the province of Los Pastos. The isthmus of Panama and the province of Veragua have at all times been dependent on the Audiency of Santa Fe.

Peru. In estimating the extent of the present Peru at 41,500 square leagues (20 to a degree), the eastern boundary is, first, the course of the Rio Javary, from 6° to 9½° south latitude; secondly, the parallel of 9½°, stretching from the Javary towards the left bank of the Rio Madeira, and cutting successively other tributary streams of the Amazon, namely, the Jatahy (Hyutahy), the Jurura, the Tefe, which appears to be the Tapy of Acuña, the Coary, and the Puruz; thirdly, a line which first runs up the Rio Madeira, and then the Mamore, since called the Salto de Theotino, as far as the Rio Maniqui *, between the confluence of the Guaporè (Ytonamas of the Jesuits) and the mission of S. Ana, (about 12½° south latitude); fourthly, the course of the Maniqui towards the west, and in stretching a line to the Rio Beni, which geographers believed to be a tributary stream, sometimes of the Rio Madeira, and sometimes of the Rio Puruz; fifthly, the right bank of the Rio Tequeari, which flows into the Beni, below the Pueblo de Reyes, and the sources of the Tequieri; a line

* See a scarce map of the *Missiones de Mojos de la Compania de Jesus*, 1713. The Rio Maniqui, to which modern geographers have given so much importance, by the fable of the lake Rogagualo, and the bifurcations of the Beni, joins the Yacuma, by which Mr. Haenke went from *Pueblo de Reyes* to the Rio Mamore.

which crosses the Rio Ynambari, stretches on the south-east towards the lofty Cordilleras of Vilcanota and Lampa, and separates the Peruvian districts of Pancartambo and Tinta from the district of Apolobamba, and the basin of the lake of Titicaca (Chucuito); sixthly, from the 16° of south latitude, the western chain of the Andes, bordering the basin of the lake of Titicaca, towards the west, and dividing by the parallel of 20° the tributary streams of the Desaguadero from the small Laguna of Paria, and those of the Rio Pilcomayo from the torrents that throw themselves into the South Sea. According to these limits, Peru on the north (as far as the Javary), is 200 leagues in width, and as far as the Rio de la Madeira and Mamore, 260 leagues in the direction of the parallels of latitude; while towards the southern extremity of the country, its mean breadth is not more than from 15 to 18 leagues. The partido of Tarapaca (in the intendancy of Arequipa) reaches the desert of Atacama, or the mouth of the Rio de Loa, which is placed by the expedition of Malaspina in 21° 26′ south latitude, and forms the line of demarkation between Peru and the viceroyalty of Buenos Ayres. In detaching from Peru the four intendencies of La Paz, Charcas or La Plata, Potosi, and Cochabamba, there have been subjected to a government stationed on the banks of La Plata, not only the provinces where the waters flow towards the south-east, and the vast regions in which arise the Ucayale and the Madeira (tributary streams of the Amazon), but also the inland system of rivers, which, on the summit of the Andes, and in a longitudinal valley, terminated at its two extremities by the *clusters of mountains*

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* The *Partidos* of Paucartambo and Tinta, belong to the intendancy of Cuzco. The district of Apolobamba and the basin of the lake of Titicaca, pertain to the ancient viceroyalty of Buenos Ayres.

of Porco and Cuzco, swell the alpine lake of Titicaca. Notwithstanding these arbitrary divisions, the associations of the Indians who inhabit the banks of that lake, and the cold regions of Oruro, La Paz, and Charcas, are oftener directed towards Cuzco, the centre of the ancient grandeur of the empire of the Incas, than towards the plains of Buenos Ayres. The table-land of Tiahuanacu, where the Inca Mata-Capac discovered buildings and gigantic statues, of which the origin extended back beyond the foundation of Cuzco, has been detached from Peru. To attempt thus to efface the historical remembrances of nations, is to call Greece by the name of the banks of the lake Copais. It is probable that in the numerous confederations of states which are forming in our days, the lines of demarkation will not be solely regulated by the course of the waters, but that in fixing them the moral interests of nations will at the same time be consulted. The partition of Upper Peru must be regretted by all who know how to appreciate the importance of the native population on the table-lands of the Andes. If a line be drawn from the southern extremity of the province of Maynas, on the banks of the Guallaga, to the confluence of the Apurimac and the Beni (which confluence gives birth to the Rio Ucayale), and thence to the westward of the Rio Vilcabamba, and the table-land of Paucartambo, towards the point where the south-east frontier cuts the Rio Ynambari, it will divide Peru into two unequal parts; one (of 26,220 square leagues), is the centre of the civilized population, the other (of 15,200 square leagues), is wild, and almost entirely uninhabited.

Buenos Ayres. The editors of the excellent periodical work entitled *El Somanario* (vol. i, p. 111), justly observe, that even on the banks of La Plata no one knows the real limits of the ancient viceroyalty of Buenos Ayres. Between the Parana and the Rio Paraguay, between the sources of the

latter river and the Guaporè, which is a tributary stream of the Madeira, the boundaries are disputed by the Portuguese; and it is uncertain if they ought to be extended on the south beyond the Rio Colorado as far as the Rio Negro, which receives the waters of the Rio del Diamante (*Abeja Argentina* 1822, N° 1, p. 8, and N° 2, p. 55). Amidst these uncertainties, which are augmented by the partition of Paraguay and the *Cisplatine Province*, I have calculated the dimensions of the vast territory of the viceroyalty, according to the limits traced on the Spanish maps before the revolution of 1810. Those limits are, on the east, the *Marco*, a little to the northward of the fort of Santa Teresa, at the mouth of the Rio Tahym; from thence they stretch to the N. N. W. by the sources of the Ibicuy and of the Juy (cutting the Uruguay in latitude 27° 20′) to the confluence of the Parana and the Yguazu; on the north along the left bank of the Parana as far as 22° 42′ south lat.; on the N. W. following the Ivineima, towards the presidency of Nova Coimbra (lat. 19° 55′), founded in 1775; on the N. N. W. near Villa Bella and the isthmus which separates the waters of the Aguapchy (a tributary of the Paraguay) and those of the Guaporè towards the junction * of the latter river with the Mamorè, below the fort of Principe (11° 54′ 46″ south lat); on the S. W. ascending the Mamorè and the Maniqui, as we stated above when we traced the limits of Peru and the viceroyalty of Buenos Ayres. Between the 21° 26′ and 25° 54′ of south lat. (between the Rio de Loa and Punta de Guachò), the territory of the viceroyalty reaches beyond the Cordillera of the Andes, and occupies for a distance of ninety leagues the coast of the South Sea. Here lies the desert of Atacama, in which is situated the small port of Cobija, which might

* P. 40.

be so useful for the exportation of the productions of the Sierra, or of Upper Peru. On the west, the western chain of the Andes, as far as 37° of latitude; and on the south the Rio Colorado, called also Desaguadero de Mendoza (lat. 39° 56′), or, according to the most recent authorities, the Rio Negro, separate Buenos Ayres from Chili and the Patagonian coast.

As Paraguay, the province *Entre Rios*, and *Banda Oriental* or the *Cisplatine Province* * may possibly remain separated from the state of Buenos Ayres, I have thought it right to calculate separately the contents of these countries in dispute. I have found in the limits of the ancient viceroyalty, between the Sea and the Rio Uruguay, 8960 square marine leagues; between the Uruguay and the Parana (Provincia entre Rios) 6848 square leagues; and between the Parana and the Rio Paraguay (the province of Paraguay properly so called) 7424 square leagues. These three parts on the east of the Rio Paraguay, from New Coimbra as far as Corrientes, and on the east of the Rio Parana, from Corrientes as far as Buenos Ayres, form a space of 23,232 square leagues †, nearly half as large again as France. I find consequently, for the three parts of which the ancient viceroyalty of Buenos Ayres is composed, including 18,300 square leagues of *pampas*, or savannahs:

Northern district, or Upper Peru,
from Tequieri and Mamorè, as
far as Pilcomayo, between 13
and 21 degrees of south lat. ....37,020 sq. marine leagues

* The extent of territory comprised between the sea, the Rio de la Plata, the Uruguay, the Missions, and the Brazilian captaincy of Rio Grande. (*Auguste de Saint-Hilaire, Aperçu d'un voyage dans l'interieur du Bresil*, 1823, p. 1.)

† Nearly 36,300 square leagues, 25 to a degree, and not 50,263 of these leagues, as the journals of Buenos Ayres assert.

Western district, or the country between Pilcomayo, Paraguay, the Rio de la Plata, the Rio Negro, and the Cordillera of the Andes (Tarija, Jujuy, Salta, Tucuman, Cordova, Santa-Fe, Buenos Ayres, San Luis de la Punta and Mendoza)	66,518 sq. marine leagues
Eastern district, that is, all on the east of the Rio Paraguay and the Parana	23,232
	126,770

The government of Buenos Ayres might partly find a compensation for the losses with which it is menaced on the north-east, by clearing a territory of 5054 square leagues, situated between the Rio Colorado and the Rio Negro. The Patagonian plains as far as the Straits of Magellan, present more than 31,206 square leagues, of which nearly two thirds are in a much more temperate climate than is generally supposed.

In that part of the viceroyalty occupied by the Brazilians on the east of the Uruguay, we must distinguish* between the limits recognized before the occupation of the *Province of the Missions*, on the north of the Rio Ibicuy, in 1801, and the boundaries established by the treaty concluded in 1821, between the Cabildo de Montevideo and the Captain-generalship of Rio Grande. The *Province of the Missions* is contained between the left bank of the Uruguay, the Ibicuy, the Toropi, a tributary stream of the latter, the Sierra de Saint Xavier, and the Rio Juy (a tributary stream of the Uruguay). Its

*. These statements are founded on the manuscript notes which Mr. Auguste de Saint-Hilaire collected on the spot.

territory extends even beyond the Juy, towards the plains where the most northern mission of San Angel is placed; farther on, are forests inhabited by independent Indians. When, in consequence of the alliance between Spain and France, England, in February 1801, made the Portuguese declare war against Spain, the Spanish province of the Missions was easily invaded. The hostilities did not last long; and although the court of Madrid disputed the legality of the occupation, the Missions remained in the hands of the Portuguese. The treaty of 1777 ought to constitute the basis of the limits between the viceroyalty of Buenos Ayres, and the captain-generalship of Rio Grande. Those limits were formed by a line extending first to the Rio Guaray (the Guaney of Arrowsmith), and the sources of the small rivers Ibirapuita, Nanday and Ibycuimerim, that empty themselves into the Ibicuy, (lat. 29° 40′) at the confluence of the Rio de Ponche Verde with the Ibicuy, then continuing towards the south-east, to the source of the Rio Negro, (a tributary stream of the Uruguay), it crosses the lake Merin, towards the mouth of the Itahy, vulgarly called *Tahym*. The most southern Portuguese *marco* is found at the mouth of this river, on the sea coast. The country between the Tahym and the Rio Chuy, a little north of Santa Teresa, was neuter, and bore the name of *Campos neutraes*; but, notwithstanding the diplomatic conventions, it was in 1804 already occupied for the most part by Portuguese cultivators. The invasion of Spain by the French, and the revolutions of Buenos Ayres, have given the Brazilians facility to push their conquests as far as the mouth of the Uruguay, so that the new interior limits, between antient Brazil and the countries recently occupied, were fixed in 1821, without the intervention of the congress of Buenos Ayres, by the deputies of the *cabildo* of Montevideo, and of the captain-generalship of Rio Grande. It was agreed that the *Cisplatine Province* of Brazil (the *Oriental Band*, according to the geo-

graphic nomenclature of the Spaniards), should be bounded on the north by the confluence of the Uruguay with the Arapay (Ygarupay of Arrowsmith); on the east by a line which, beginning at Angostura, 6 leagues south of Santa Teresa, passes by the marsh of Saint Michel, follows the Rio San Luis as far as its mouth in the lake Merin, stretches along the western bank of that lake, at a distance of 800 toises, passes by the mouth of the Rio Sabuaty, goes up to that of the Rio Jaguarao, and following the course of this river as far as Cerros de Angona, crosses the Rio Negro, and continuing a curve at the north-west, rejoins the Rio Arapuy. The space comprehended between the Arapuy and the Ibicuy, the southern limit of the province of the Missions, belongs to the captain-generalship of Rio Grande. The Portuguese Brazilians have not yet attempted to form settlements in the province *Entre Rios*, (between the Parana and the Paraguay), a country devastated by Artigas and Ramirez.

In the savannahs (*pampas*), which, like an arm of the sea, extend from Santa-Fe on the north, between the mountains of Brazil, and those of Cordova and Jujuy*, the natural limits of the intendancies of Potosi and Salta, that is of Upper Peru and Buenos Ayres, seem likely to be altogether confounded. Chichas and Tarija are considered as the most southern provinces of Upper Peru; the plains of Manso between Pilcomayo and the Rio Grande, or Vermejo†, as well

* This town, according to M. Redhead (*Memoria sobre la dilatacion del aire atmosferico; Buenos Ayres*, 1819, p. 8 and 10), is situated 700 toises above the level of the sea. The absolute height of the town of San Miguel del Tucuman is, according to the barometric measurement of the same author, (an inhabitant of Salta) 260 toises.

† The real name of this river, the banks of which were heretofore inhabited by the Abipons, is Rio Iñate. (See *Dobrizhofer, Hist. de Abiponibus*, 1784, Tom. ii, p. 14).

as Jujuy, Salta, and Tucuman, belong to Buenos Ayres, properly so called. The limit of Upper Peru is now, on the east, only an imaginary line traced across uninhabited savannahs. It cuts the Cordillera of the Andes at the tropic of Capricorn, and thence crosses, first, the Rio Grande, 26 leagues below San Yago de Cotagayta; then the Pilcomayo, 22 leagues below its confluence with the Cachimayo, which flows from la Plata or Chuquisaca; and, finally, the Rio Paraguay, in the 20° 50′ of south latitude. If the basin of the lake of Titicaca, and the mountainous part of Upper Peru, where the language of the Inca prevails, were to be reunited to Couzco, the plains of Chiquitos and Chaco might still form a part of the government of the Pampas of Buenos Ayres.

Chili. The limits of Chili on the north are the desert of Atacama, on the east the Cordillera of the Andes, where the road of the couriers passes between Mendoza and Valparaiso, at the height, according to barometric measures taken in 1794 by M. d'Espinosa and Bauza, of 1987 toises* above the level of the sea. I took for the southern limit† the entrance of the gulf of Chiloè, where the fort of Maullin (lat. 41° 43′) is the most southern possession of Spanish America on the continent. The bays of Ancud and Reloncavi no longer present any fixed settlements of European colonists; there begin the Juncos, who are independent, not to say wild Indians. From these statements it results, that the European settlements extend much farther to the south,

* This is, however, 440 toises less than the culminant point of the road of Assuay, between the towns of Quito and Cuenca, of which I took the level in 1802. See my *Obs. astron.* Tom. i, p. 312, No. 209.

† Political Essay on New Spain, vol. i, p. 6; vol. iv, p. 285.

on the western, than on the eastern coast of the continent; the former have already passed a degree of latitude beyond the parallel of the Rio Negro and the Puerto de San Antonio. The capital of Santiago, of Chili, is situated on a table-land of the same elevation as the town of Caraccas*.

Brazil. The southern limits of Columbia, the eastern limits of Peru, and the northern limits of Buenos Ayres, determine the boundary of the Brazilian territory on the north, the west, and the south. In order to calculate the superficial contents, I employed manuscript maps, which were communicated to me by the government of Rio Janeiro, at the time when the very vague terms of the 8th article of the treaty of Utrecht, and the 107th article of the act of the Congress of Vienna†, had given rise to diplomatic

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* 409 toises, according to Mr. Bauza, which is three hundred toises lower than the town of Mendoza, at the opposite declivity of the Cordillera of the Andes. (*Manuscript notes of Don Luis Neo, botanist of the expedition of Malaspina.*)

† See above, vol. v, p. 842. The Brazilian limits, in the government of the Rio Negro, were examined by the astronomers José Joaquim Victorio da Costa, José Simoens de Carvalho, Francisco José de Lacerda, and Antonio Luiz Pontes; and in the government of Grand Para, especially between the Araguari and the Calsoené (Rio Carsewens of the *Map of the Coast of the Guyana*, published by the Depot of the Marine in 1817), by the astronomer Jozé Simoens de Carvalho, and the Colonel of Engineers Pedro Alexandrino de Souza. The French have long extended their pretensions beyond the Calsoene, near Cape Nord. The boundary is now thrown back as far as the mouth of the Oyapok. The principal tributary stream of that river, the Canopi, and the Tamouri, which is a tributary stream of the Canopi, draw near each other at a league distant (lat. 2° 30′?)

disputes respecting the French and Portuguese Guyanas. By drawing a line from north to south, by the mouth of the

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from the source of the Maroni, or rather from one of its branches, the Rio Araoua, near the village of the Aramichaun Indians. The Portuguese being desirous of tracing the limits between the Oyapok and the Araguari (Araouari), caused the latitude of the source of the latter river to be carefully examined by Colonel de Souza; it was found to be further north than the mouth, which has placed the frontier in the parallel of Calsoene. The name of the Rio de Vicente Pinçon, become celebrated in the annals of diplomatic disputes, has disappeared on the new maps. According to an ancient manuscript Portuguese map in my possession, and where the coast is marked between San José de Macapa and the Oyapok, the Pinçon must be identical with the Calsoene. I suspect that the unintelligible terms of the 8th article of the treaty of Utrecht ("the line of the *river Japoc or Vincente Pinçon*, which ought to cover the possessions of the cape and of the north") are founded on the denomination of Cape North, sometimes given to Cape Orange. (See *Laet Nov. Orb.* 1633, p. 636). M. de la Condamine, whose sagacity nothing escapes, has already said, in the *Relation de son Voyage à l'Amazone*, p. 199, "the Portuguese have their reasons for confounding the bay (?) of Vincent Pinçon, near the western mouth of the Rio Arawari (Araguari), lat 2° 2', with the river Oyapok, 4° 15' lat. The peace of Utrecht makes it one river." This latitude 2° 2' would bring the imaginary river of Pinçon near the Majacari and the Calsoene, and remove it nearly one degree from the Araguari, which is in lat. 1° 15'. Mr. Arrowsmith, whose map furnishes excellent materials for tracing the mouth of the Amazon, places the Rio de Vicente Pinçon on the south of Majacarè, where the Matario loses itself in a bay, opposite which the small isle Tururi is situated, lat. 1° 50'. As the Araguari, communicating with the Matario,

river of the Tocantins, and following the course of the Araguay, 40 leagues to the west of Villaboa, towards the point where the Rio Parana cuts the tropic of Capricorn, we divide Brazil into two parts. That on the west comprehends the captain-generalship of Grand Pará, Rio Negro, and Matto Grosso; it is almost wholly uninhabited, and contains European settlements only on the banks of rivers, on those of the Rio Negro, Rio Branco, the Amazon, and the Guaporè, which unites with the Rio Madeira. It is 138,156 square leagues in extent (20 to a degree), while the eastern part, comprehending the captain-generalship of the coast, Minas-Geraes, and Goyaz, is 118,830 square leagues. My estmates are conformable to those of a very distinguished geographer, M. Adrien Balbi, who computes 2,250,000 square Italian miles (250,000 square marine leagues), for the whole Brazilian empire, excluding as I have done, the Cisplatine province and that of the Missions, on the east of the Uruguay. (*Essai statistique sur le Portugal*, tom. ii, p. 229.)

United States. I have already remarked in another place (*Political Essay*, Vol. i, p. 13), that it became difficult to estimate the surface of the territory of the United States, in square leagues, since the acquisition of Louisiana, of which the northern and eastern boundaries long remained undetermined. They are now fixed by the convention concluded in London, October 20th, 1818, and by the treaty of the Floridas, signed at Washington, February 22d, 1819. I have therefore thought I might make this question the subject of fresh researches. I have devoted myself to this task with the greater care, as the surface of the United States

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forms a sort of delta on the north-west around the inundated lands of Carapaporis, M. de la Condamine perhaps considered the small river which flows opposite the isle Tururi as the western branch of the Araguari.

from the Atlantic Ocean to the Pacific is estimated by very recent authors at 125,400, at 137,800, at 157,500, at 173,400, at 205,500, and at 238,400 square marine leagues, 20 to a degree; and it appeared to me impossible from those varying statements, of which the difference amounts to more than 100,000 square leagues, that is to six times the *superfices* of France, to find a result with which we might compare the surfaces of the new free states of Spanish America. In some instances the same author has, at different periods, given very different estimates of the same territory, bounded by the two seas between Cape Hatteras and the Rio Columbia, between the mouth of the Mississipi and the lake des Bois. Mr. Mellish, in his map of 1816, has estimated the United States at 2,459,350 square miles (69·2 to a degree), of which the territory of the Missouri alone is made 1,580,000. In his *Travels through the United States of America*, 1818, p. 561, he fixes the contents at 1,683,806 square miles, of which the territory of the Missouri is estimated at 965,250. Still later, in his *Geographical description of the United States*, 1822, p. 17, he again increases the calculation to 2,076,410 square miles. These fluctuations of opinion respecting the extent of the surface of the United States cannot be attributed to the various ways in which the limits are traced: the errors for the most part which affect the extent of the territory between the Mississipi and the Rocky Mountains, and between those mountains and the coast of the Pacific, arise from mere mistakes of calculation. I find in taking the average of several estimates, on the maps of Arrowsmith, Mellish, Tardieu, and Brué:—

	Square Marine Leagues.
I. On the east of the Mississipi..... or 930,000 square miles.	77,684
a.) Atlantic part, east of the Alleghanis or 324,000 square miles. The chain	27,064

	Square Marine Leagues.
of the Alleghanis has been prolonged on the north towards Plattsbourg and Montreal, and on the south by following the Apalachicola, so that the greater part of Florida belongs to this Atlantic division.	
b.) Between the Alleghanis and the Mississipi	50,620
or 606,000 square miles.	
II. On the west of the Mississipi	96,622
or 1,156,800 square miles.	
a.) Between the Mississipi and the Rocky Mountains, comprehending the lakes	72,531
or 868,400 square miles.	
b.) Between the Rocky Mountains and the coast of the Pacific, taking for the southern and northern limits the parallels 42° and 49° (Western Territory).	24,091
or, 288,400 square miles.	
Territory of the United States, between the two Oceans, 2,086,800 square miles, or ...	174,306
square marine leagues, of 20 to a degree.	

The whole territory of the United States, from the Atlantic Ocean to the Pacific, is consequently a little larger than Europe, to the westward of Russia. The Atlantic part alone may be compared to Spain and France united; the district between the Alleghanis and the Mississipi, to Spain, Portugal, France, and Germany; the portion westward of the Mississipi, to Spain, France, Germany, Italy, and the Scandinavian kingdoms. The Mississipi consequently divides the United States into two great portions, of which the former, or eastern division, advancing rapidly in culture and civilization,

contains a superficial extent equal to that of Mexico; and the latter, the western division, almost entirely wild and unpeopled, a territory as large as that of the republic of Columbia.

In the statistical researches which have been prosecuted in several countries of Europe, important consequences have been drawn from the comparison of the relative population of the maritime and inland provinces. In Spain* these relations are to one another as 9 to 5; in the United Provinces of Venezuela, and, above all, in the ancient captain-generalship of Caraccas, they are as 35 to 1. How powerful soever may be the influence of commerce on the prosperity of states, and the intellectual development of nations, it would be wrong to attribute in America, as we do in Europe, to that cause alone the differences we have just remarked. In Spain and Italy, if we except the fertile plains of Lombardy, the inland districts are arid, filled with mountains, or high table-lands; the meteorological circumstances on which the fertility of the soil depends, are not the same in the lands bordering on the sea as they are in the central provinces. Colonization in America has generally begun on the coast, and advanced slowly

* *Antillon, Geografia astronomica, natural y politica*, 1815, p. 145.

towards the interior; such is its progress in Brazil and in Venezuela. It is only where the coast is unhealthy, as in Mexico and New Grenada, or sandy and exempt from rain as in Peru, that the population is concentrated on the mountains, and the table-lands of the interior. These local circumstances are too often overlooked in discussing the future fate of the Spanish colonies; they communicate a peculiar character to some of those countries of which the physical and moral analogies are less striking than is commonly believed. Considered with reference to the distribution of the population, the two provinces of New Grenada and Venezuela, which have been united in one political body, present the most complete contrast. Their capitals (and the position of capitals always denotes in what district the population is most concentrated) are situated at such unequal distances from the trading coasts of the Caribbean sea, that the town of Caraccas, to be placed on the same parallel with Santa-Fe de Bogota, must be transplanted towards the south, to the junction of the Oroonoko with the Guaviare, where the mission of San Fernando de Atabapo is situated.

The republic of Columbia, is, with Mexico and Gautimala, the only state of Spanish America which occupies the coast opposite to Europe, as well as that which is opposite to Asia.

There are 400 leagues from Cape Paria to the western extremity of Veragua; and 260 from Cape Burica to the mouth of Rio Tumbez. The shore possessed by the republic of Columbia consequently equals in length the coast from Cadiz to Dantzick, or from Ceuta to Jaffa. This immense resource for national industry is combined with a degree of cultivation of which the importance has not hitherto been sufficiently recognized. The isthmus of Panama forms a part of the territory of Columbia, and that neck of land, traversed by five roads, and stocked with camels, may one day serve as a *portage* for the commerce of the world, even though neither the plains of Cupica, the bay of Mandinga, nor the Rio Chagre, should ever present the possibility of a canal fit for the passage of vessels going from Europe to China*, or from the United States to the north-west coast of America.

In the course of this work, when considering the influence which the *configuration* of countries (that is, the elevation and form of their coasts,) exerts in every district on the progress of civilization and the destiny of nations, I have often insisted on the disadvantages of those vast masses of triangular continents, which, like

* The ancient vice-royalty of Buenos-Ayres extended also along a small portion of the South Sea coast; but we have seen above (page 170), how desert is this portion.

Africa, and the greater part of South America, are destitute of gulfs and inland seas. We will not here dwell on the observation, that the existence of our Mediterranean has been closely connected with the first dawn of human cultivation among the nations of the west, and that the articulated form of the lands, the frequency of their contractions, and the concatenation of peninsulas, favoured the civilization of Greece, Italy, and perhaps of all Europe, to the westward of the meridian of the Propontis. In the New World the uninterruptedness of the coasts, and the monotony of their straight lines, are most remarkable in Chili and Peru. The shore of Columbia is more varied, and its spacious gulfs, such as that of Paria, Cariaco, Maracaybo, and Darien, were at the time of the first discovery better peopled than the rest, and facilitated the interchange of productions. That shore possesses an incalculable advantage in being washed by the Caribbean sea, a kind of inland sea with several outlets, and the only one pertaining to the New Continent. This basin, the different shores of which belong to the United States, the republic of Columbia, Mexico, and some maritime powers of Europe, gives rise to a peculiar system of trade, exclusively American. The south-east of Asia, with its neighbouring Archipelago, and above all, the state of the Mediterranean in the time of the

Phenician and Greek colonies, have proved the happy influence of the nearness of opposite coasts which have not the same productions, and are inhabited by nations of different races, on commercial industry and intellectual cultivation. The importance of the inland sea of the Antilles, bounded by Venezuela on the south, will be still augmented by the progressive increase of population on the banks of the Mississipi; for that river, the Rio del Norte and the Magdalena, are the only great navigable streams which it receives. The depth of the American rivers, their immense branches, and the use of steam boats, every where facilitated by the proximity of forests, compensate to a certain extent the obstacles arising from the uniform line of the coasts, and the general configuration of the continent, in the promotion of industry and civilization.

By comparing, according to the tables we have furnished above, the extent of the territory and the entire population, we should obtain the result of the connection of those two elements of public prosperity, a connection that constitutes the *relative population* of every state in the New World. We should find to every square marine league, at Mexico, 90; in the United States, 58; in the republic of Columbia, 30; and in Brazil, 15 inhabitants; while Asiatic Russia furnishes 11; the whole Russian

empire 87 ; Sweden with Norway, 90 ; European Russia*, 320 ; Spain, 763 ; and France, 1778. But these estimates of relative population, when applied to countries of immense extent, and of which a great part is entirely uninhabited, furnish mathematical abstractions that afford little instruction. In countries uniformly cultivated,

* The superficial extent of European Russia, without Finland and the Grand Duchy of Warsaw, was in 1805, according to the statistical tables of Mr. Hassel (*Umriss der Europ. Staaten*, Tom. 1, p. 10), 138,000 square leagues, 20 to a degree, with a population of 36,400,000 souls ; according to the same tables, the extent of the whole Russian monarchy was 603,160 square leagues, with 40 millions of population. These estimates of 1805 would give but 264, and 66 inhabitants to the square league. In supposing with Mr. Balbi (see his interesting researches on the population of Russia, in the *Compendio di Geografia universale*, pp. 143, and 163, and the *Statistical Essay on Portugal*, Vol. ii, p. 253), the superficial extent of European Russia with Finland and the kingdom of Poland, to be 169,400 square leagues, the *superfices* of the whole Russian monarchy in Europe and in Asia, 686,000 square leagues, and the actual population in 1822 to be from 48 to 54 millions, we find 283 and 78 *inhabitants to the square league.* According to researches which I have recently made relative to the extent of Russia, I fix, for the whole empire, comprehending Finland and Poland, 616,000 square leagues ; for the European part, comprehending the ancient kingdoms of Kasan and Astrakhan, with the exception of the government of Perme, 150,400 square leagues, which yields the relative population of 318 and 87, stated in the text. (See also *Gaspari, Vollst. Hand. der Erdb.* B. xii, p. 210.

in France * for instance, the number of inhabitants to the square league, calculated by separate departments, is generally only a third, more or less, than the relative population of the sum of all the departments. Even in Spain, the oscillations from the average number rise, with a few exceptions, only from the half to the double †. In America, on the contrary, it is only in the Atlantic states, from South Carolina to New Hampshire, that the population begins to spread itself with some uniformity. In that most civilized portion of the New World, form 130 to 900 inhabitants are reckoned to the square league, while the relative population of all

* The superficial extent of France, not comprehending Corsica, was estimated by the direction of the Cadastre, in 1817, at 51,910,062 hectares, or 5190 square myriameters, or 26,278 square leagues; 25 to a degree. M. Coquebert de Montbret reckons 442 square leagues for Corsica; consequently France with Corsica now contains 26,720 common square leagues, or 17,101 square leagues (20 to a degree). The population in 1820, having been 30,407,907, we find 1779 inhabitants to every square marine league. The average extent of a department of France is 198 square marine leagues; the *mean* population is 353,600. The number of inhabitants to the square league is, in most of the departments, 1000, 1200, 2400, and 2600. In taking the average of the five most and least peopled departments and governments of France and Russia, we obtain the proportion of the minimum and maximum of the relative population; in the former of these countries = 1 : 3,7; in the latter = 1 : 12,2.

† *Antillon, Geografia*, p. 141.

the Atlantic states, considered together, is 240. The extremes (North Carolina and Massachusets) are only in the relation of 1 to 7, nearly as in France *, where the extremes, in the department of the Upper Alps and of the North, are also in the relation of 1 : 6,7. The oscillations from the mean number, which we generally find restricted to narrow limits in the civilized countries of Europe †, exceed, so to speak, all

* In continental France, excluding Corsica; for the department of the Liamone is still worse peopled than that of the Upper Alps. The department of the North had, in 1804, on 178 square leagues (20 to a degree) a population of 774,500; and in 1820, of 904,500. The department of the Upper Alps had, in 1804, on 160 square leagues, a population of 118,322, and in 1820, of 121,400. There are, therefore, in these two departments, 5082, and 758 inhabitants to the square league.

† *Europe*, bounded by the Jaik, the mountains of the Oural and the Kara, contains 304,700 square marine leagues. In supposing the inhabitants to be 195 millions, a relative population is formed of 639 to the square league, a little less than that of the department of the Upper Alps, and a little more than that of the inland provinces of Spain. In comparing the *total mean* of 639 with the *partial mean* of European countries that do not contain less than 600 square leagues, we obtain, excluding Laponia only, and four governments of Russia (Archangel, Olonez, Wologda, and Astrakhan), 160 for the most desert regions of Europe; and for the most peopled, 2400 souls to the square league. These numbers give the relation of the extremes = 1 : 15. *America* contains, according to my last calculations, 1,184,800 square marine leagues, from Cape Horn to the 68° of north

measure in Brazil, in the Spanish colonies, and even in the confederation of the United States, when considered in its whole extent. We find in some intendances in Mexico (La Sonora and

lat., comprehending the West Indies; and in estimating the population as we have done above, at 34,284,000, we scarcely obtain 29 inhabitants to the square league. Now to find a continuous surface of 600 square leagues, and which is at the same time the most peopled of all America, we must have recourse to a part of the table-land of Mexico, or of New England, where three contiguous states, Massachusets, Rhode Island, and Connecticut, contained in 1820, an entire population of 881,594, on 12,504 square English miles, consequently nearly 840 souls to the square marine league. We can only select among the West India Islands, of which the population is extremely concentrated, the Great Antilles; for the Little Antilles (or the Eastern Caribbean Isles), from Culebra and St. Thomas to Trinidad, contain altogether but 387 square leagues. Jamaica has nearly the same relative population as the three states of New England, which we have just mentioned; but its surface does not extend to 500 square leagues. St. Domingo (Haïti), which is five times larger than Jamaica, has only 266 inhabitants to the square league. Its relative population scarcely reaches that of New Hampshire. I shall not venture to indicate the fraction which we may suppose to be the *minimum* of the relative population of the New World; for instance, in the savannahs between the Meta and the Guaviare, or in Spanish Guyana, between the Esmeralda, the Rio Erevato, and the Rio Caura, or finally, in North America, between the source of the Missouri and the Slave Lake. It is probable that the relation of the extremes, found in Europe to be as 1 : 15, is, in the New World, even excluding the Llanos or Pampas, at least 1 : 8000.

Durango) from 9 to 15 inhabitants to the square league, while in others, on the central table-land, there are more than 500. The relative population of the country situated between the eastern bank of the Mississipi and the Atlantic states is scarcely 47, while that of Connecticut, Rhode Island, and Massachusets is more than 800. On the west of the Mississipi, as well as in the interior of Spanish Guyana, there are not 2 inhabitants to the square league on much larger extents of territory than Switzerland or Belgium. The state of these countries is like that of the Russian empire, where the relative population of some Asiatic governments (Irkutzk and Tobolsk), is to that of the best cultivated European districts, as 1 to 300.

The prodigious difference which exists in countries newly cultivated, between the extent of territory and the number of inhabitants, renders it necessary to enter into these partial estimates. When we learn that New Spain and the United States, taking their entire extent at 75,000 and 174,000 square marine leagues, give respectively, 90 and 58 souls to each league, the idea we form of that distribution of the population, on which the political force of nations depends, is as little correct as that we should obtain of the climate of a country, that is, of the distribution of the heat in the different seasons, by the knowledge

solely of the mean temperature of the whole year *. If we take from the United States all their possessions west of the Mississipi, their relative population would be 121 instead of 58 to the square league, consequently much greater than that of New Spain; in taking from the latter country the *Provincias internas* (north and north-east of Nueva Galicia), we should find 190, instead of 90, souls to the square league.

The following are the particular statements

* It would be taking me too far from my subject to push this comparison farther, and discuss to what degree the whole of the means might throw light on the mode of distribution both of the temperature and of the population. I have endeavoured to prove in another place (*Des lignes isothermes*, pp. 62, and 71) that, *in the system of European climates*, the mean temperature of the winter begins to be below the point of congelation, only where the mean temperature of the whole year sinks at least 10° of the centigrade thermometer. The lower is the mean annual temperature, so much greater is the difference of temperature of the winter and the summer. In the same manner the very feeble relative population of a whole country, of considerable extent, generally indicates that state of dawning cultivation which produces great inequality in the distribution of the inhabitants. What Buffon, with that propriety of expression which characterizes his style, has called *extreme climates*, (the climates of the interior of continents where very severe winters succeed very hot summers,) corresponds in some measure with population unequally accumulated; and two phenomena of a nature entirely different, furnish, if we consider them as mere *quantitative* estimates, very remarkable analogies.

for Venezuela and New Grenada, according to the numbers which we have reason to believe to be the most exact:

	Inhabitants to the Sq. Mar. Lea.
Republic of Columbia	30
Six times larger than Spain, nearly equal in extent to the United-States, westward of the Mississipi. Superficial extent, 91,950 square leagues. Actual population, 2,785,000.	
A. *New Grenada* (with the province of Quito)	34
Not quite four times the size of Spain. *Superficies*, 58,250 square leagues. Actual population, 2 millions.	
B. *Venezeula*, or ancient *Capitania-general* of Carraccas	23
More than twice the size of Spain; equal in extent to the *Atlantic States* of North America. *Superficies*, 33,700 square leagues. Actual population, 785,000.	
a. *Cumana* and *Barcelona*	37
Superficies, 3515 square leagues: Actual population, 128,000.	
b. *Caraccas* (with Coro).....	81
Superficies, 5140 square leagues. Actual population, 420,000.	
c. *Maracaybo* (with Merida and Truxillo)	40
Superficies, 3548 square leagues: Actual population, 140,000.	
d. *Varinas*	28
Superficies, 2678 square leagues. Actual population, 75,000.	
e. *Guyana* (Spanish Guyana).....	2
Superficies, 18,793. Actual population, 40,000.	

It results from this statement that the provinces of Caraccas, Maracaybo, Cumana, and Barcelona, that is, the maritime provinces of the north, are the best peopled of the ancient *Capitania-general*; but, in comparing this relative population with that of New Spain, where the two intendancies of Mexico and Puebla alone contain, on an extent scarcely equal to the *superficies* of the province of Caraccas, a greater actual population than that of the whole republic of Columbia, we see that the Mexican intendancies, which, with respect to the concentration of their culture, occupy but the 7th or 8th rank (Zacatecas and Guadalaxara), contain more inhabitants to the square league than the province of Caraccas. The average of the relative population of Cumana, Barcelona, Caraccas, and Maracaybo, is 56; and, as 6200 square leagues, that is, one half of the extent of these four provinces, are almost desert steppes *, (*Llanos*,) we find, in reckoning the *superficies* and the feeble population of the steppes, 102 inhabitants to the square league. An analogous modification gives the province of Caraccas

* The superficial extent of the steppes of these four provinces is 6219 square leagues, 20 to a degree. The following statements may enable us to judge of the agricultural state of those districts in which the steppes present such great obstacles to the rapid progress of population. (Vol. vi. pp. 59—68.)

Province

alone, a relative population of 208, that is, only one-seventh less than that of the *Atlantic States* of North America.

As in political economy, numerical state-

	Sq. Leagues.
Province of *Cumana:*	
Mountainous part of the Cordilleras of the coast and Caripe	393
Llanos, or savannahs	1558
	1951
Of which the marshy delta of the Oroonoko is 652 sq. leagues.	
Province of *Barcelona:*	
The rather mountainous part, and the forests towards the North	223
Llanos	1341
	1564
Province of *Caraccas:*	
Mountainous part	1820
Llanos, comprehending Carora and Monai	3320
	5140

These calculations yield 6219 square leagues of steppes, or savannahs, of which 130 are to the westward of the Rio Portugueza. Now the *Llanos* of Varinas, between that river, the Apure, and the mountains of Pamplona, Merida, and Paramo de las Rosas, contain 1664 square leagues; it thence results, that the immense basin of the *Llanos* comprehended between the Sierra Nevada de Merida, the delta of the *Bocas Chichas,* inhabited by the Guaraon Indians, and the northern banks of the Apure and the Oroonoko, present a *superficies* of 7753 square leagues, equal to half the extent of Spain. The actual population of the savannahs of Caraccas, Barcelona, and Cumana, appears to me, on account of their populous cities, to be now above 70,000 souls.

ments become instructive only by a comparison with analogous facts, I have carefully examined what, in the actual state of the two continents, might be considered as a small relative population in Europe, and a very great relative population in America. I have, however, chosen examples only among the provinces which have a continued surface of more than 600 square leagues, in order to exclude the *accidental accumulations* of population which are found around great cities; for instance, on the coast of Brazil, in the valley of Mexico, on the table-lands of Santa-Fe de Bogota and Couzco; or finally, in the small West India islands (Barbadoes, Martinico, and St. Thomas), of which the relative population is from 3000 to 4700 inhabitants to the square league, and consequently equal to the most fertile parts of Holland, France, and Lombardy.

MINIMUM OF EUROPE.

	To the Sq. Lea.
The four governments the least peopled of *European Russia:*	
Archangel	10
Olonez	42
Wologda and Astrakhan	52
Finland	106
The province the least peopled of *Spain*, that of Cuenca	311
The Dutchy of *Lunebourg*, (on account of the heaths)	550

	To the Sq. League.
The department of continental France the worst peopled, (Upper Alps)	758
Departments of France thinly peopled, (the Creuse, the Var, and the Aude)	1300

MAXIMUM OF AMERICA.

The central part of the intendancies of Mexico and Puebla*, above	1300
In the United States, Massachusets, but having only 522 square leagues of surface	900
Massachusets, Rhode Island, and *Connecticut,* together	840
The whole intendancy of Puebla	540
The whole intendancy of Mexico	460
These two Mexican intendancies together, are nearly a third of the superficial extent of France, with a suitable population (in 1823, nearly 2,800,000 souls), to prevent the towns of Mexico and Puebla from having a sensible influence on the relative population.	
Northern part of the province of Caraccas, (without the Llanos)	208

This table shews that those parts of America which we now consider as the best peopled, attain the relative population of the kingdom of Navarre, of Galicia, and the Asturias, which,

* Is there a part of the United States, from 600 to 1000 square leagues in extent, of which the relative population exceeds the *maximum* of New Spain, which is 1300 inhabitants to the square league, or 109 to the square mile, 69·2 to a degree? The relative population of Massachusets, which is 75·5 to the square mile, and is regarded as very considerable,

after the province of Guipuscoa, and the kingdom of Valencia*, reckon the greatest number of inhabitants to the square league in all Spain; the *maximum* of America is, however, below the relative population of the whole of France (1778 to the square league), and would in the latter country be considered as a very thin population. If on the entire surface of America we direct our views to the object which engages our special attention in this chapter, the *Capitania-general* of Venezuela, we find that the most populous of these subdivisions, the province of Caraccas, considered as a whole, with-

has hitherto led me to doubt this. In order to examine the question we must be able to compare the *superficies* of a certain number of bordering provinces with the registers of population published by the congress of Washington. The relative population of the States of New York, Pensylvania, and Virginia, appear so small (240, 204, and 168, to the square marine league) only because in distributing the population uniformly over the whole extent of territory, we must include the regions partly desert, possessed by each state on the west of the Alleghanis, regions which have an influence on the total average, nearly in the same manner as the *Llanos* of Caraccas and Cumana. Egypt contains 11,000 square leagues, of which only 1408 are inhabited.

* We find in the kingdom of Valencia 1860, and in the Guipuscoa, 2009, to the square league; but the latter province, containing only 53 square leagues, should be excluded, according to the principle which I have adopted in these researches. Galicia has an actual population of 1,400,000, and the kingdom of Valencia of 1,200,000.

out excepting the Llanos, has, as yet, only the relative population of Tennesée; and that this province, without the Llanos, furnishes in the northern part, on more than 1800 square leagues, the relative population of South Carolina. Those 1800 square leagues, the centre of agriculture, are twice as well peopled as Finland, but still a third less than the province of Cuenca, the least populous of all Spain. We cannot dwell on this result without a painful feeling. Such is the state in which colonial politics, and the folly of the public administration, have, during three centuries, left a country of which the natural riches may vie with all that is most wonderful on earth, that in order to find one equally desert, we must look either towards the frozen regions of the north, or to the westward of the Alleghani mountains, towards the forests of Tennesee, where the first clearings have only begun within the last fifty years!

The most cultivated part of the province of Caraccas, the basin of the lake of Valencia, vulgarly called *los Valles de Aragua**, counted, in 1810, nearly 2000 inhabitants to the square league; now, supposing a relative population three times less, and taking off from the whole surface of the *Capitania-general* nearly 24,000

* These vallies do not contain 30 square leagues of surface. (See above, Vol. iv. p. 118.)

square leagues, as being occupied by the Llanos and the forests of Guyana, and therefore presenting great obstacles to agricultural labours, we should still obtain a population of 6 millions for the remaining 9700 square leagues. Those who, like me, have lived long beneath the fine sky of the tropics, will find nothing exaggerated in these calculations; for I suppose for the portion the most easily cultivated, a relative population equal to that which exists in the intendancies of Puebla and Mexico*, full of barren mountains, and extending towards the coast of the Pacific, over regions which are almost desert. If the territories of Cumana, Barcelona, Caraccas, Maracaybo, Varinas and Guyana, should one day be fortunate enough to enjoy good provincial and municipal institutions, as confederated states, they will not require a century and a half to attain a population of six millions of inhabitants. Venezuela, the eastern part of the *Republic of Columbia*, would not, even with nine millions, have a more considerable population than Old Spain; and how can it be doubted that that part of Venezuela, which is most fertile and easy of cultivation, that is, the 10,000 square leagues remaining, after excluding the savannahs (Llanos) and

* These two intendances contain however, together, 5520 square leagues, and a relative population of 508 inhabitants to the square marine league.

the almost impenetrable forests between the Oroonoko and the Cassiquiare, could nourish, under the fine sky of the tropics, as many inhabitants as 10,000 square leagues of Estramadura, the Castilles, and other provinces of the table-land of Spain. These predictions are by no means problematical, inasmuch as they are founded on physical analogies, and on the productive power of the soil; but in order to indulge the hope that they will be actually accomplished, we must be able to take into our reckoning another element less susceptible of calculation,—that national wisdom which subdues the hostile passions, stifles the germ of civil discord, and gives stability to free and energetic institutions.

PRODUCTIONS.—When we take a view of the soil of Venezuela and New Grenada, we perceive that no other country of Spanish America supplies commerce with such various and such rich productions of the vegetable kingdom. If we add the harvests of the province of Caraccas to those of Guayaquil, we find that the republic of Columbia can furnish alone nearly all the cocoa annually demanded by Europe. The union of Venezuela and New Grenada has also placed in the hands of one people the greater part of the cincona exported from the New Continent. The temperate mountains of Merida,

Santa-Fe, Popayan, Quito, and Loxa, produce the finest qualities hitherto known of this medicinal bark. I might swell the list of these valuable productions by the coffee and indigo of Caraccas, so long esteemed in commerce; the sugar, cotton, and flour of Bogota; the ipecacuanha of the banks of the Madelaine; the tobacco of Varinas, the *Cortex Angosturæ* of Carony; the balsam of the plains of Tolu; the skins and dried provisions of the Llanos; the pearls of Panama, Rio Hacha, and the Marguerita; and finally, the gold of Popayan, and the platina, which is no where found in abundance but at Choco and Barbacoas: but, in conformity to the plan I have adopted, I shall confine myself to the ancient *Capitania-general* of Caraccas. In the preceding chapters I have treated of each particular production; it therefore only remains to mention succinctly the statistical statements connected with that peaceful period which immediately preceded the political agitations of this country.

Cacao. Total production, 193,000 *fanegas* of 110 Spanish pounds, of which Venezuela exported (inclusive of the contraband trade) 145,000 *fanegas.* Total value, more than five millions of piastres. Number of trees in 1814, nearly 16 millions. This part of Terra Firma has hitherto derived its greatest celebrity from cacao: the cultivation of it diminishes in proportion as that of coffee, cotton, and sugar increases; it advances progressively from west to east. Ca-

cao is important, not merely as an object of external trade, but also as food for the inhabitants. The interior consumption will consequently increase with the population, and it is to be hoped that the proprietors of the cacao plantations will soon find new encouragement in the increase of national prosperity. (See above, Vol. iii, pp. 191—195; Vol. iv, pp. 231—242.) The cacao of the provinces of Caraccas, Barcelona, and Cumana, of which the finest quality is found at Uritucu (near San Sebastian), Capiriquál, and San Bonifacio, is far superior to the cacao of Guayaquil; it yields only to that of Soconusco (*Juarros, Compendio de la hist. de Guatimala*, 1818, Tom. ii. p. 77) and of Gualan, near Omoa, which scarcely enters into the commerce of Europe.

Coffee. The small table-lands of from 250 to 400 toises high, that are frequent in the provinces of Caraccas and Cumana (in the Cordilleras of the shore and of Caripe), contain temperate situations extremely favourable to this plant. When it had been cultivated only 28 years, in 1812, the produce amounted to nearly 60,000 quintals. (See, on the consumption of coffee in Europe, Vol. iv, pp. 65—72).

Cotton. That of the vallies of Aragua, Maracaybo, and the gulf of Cariaco, is of a very fine quality, but the average exportation was not more than 2½ millions of pounds. (Vol. ii, pp. 69, 101, 191; Vol. iv, pp. 123—126; and *Urquinaona, Relacion de la Revol. de Venezuela*, 1820, p. 31.)

Sugar. Fine plantations were formed at the beginning of this century, in the vallies of Aragua and Tuy, near Guatiore and Caurimare; but the exportation was very trifling. (Vol. iv, pp. 83—86, and pp. 177—182). I have often in the course of this work directed the attention of the reader to the preponderance which the cultivation of colonial productions will progressively acquire in Spanish America over that of the smaller West India Islands.

Indigo. The growth of this very important article decreased much more from 1787 to 1798 than that of cacao. It is maintained with advantage only in the province of Varinas (for instance, between Mijagual and Vega de Flores), and on the banks of the Tichira. The value of the indigo of Caraccas amounted, in the most prosperous times, to 1,200,000 piastres. The exportation to La Guayra, in 1794, was 900,000 pounds, and in 1809, 7000 *surrones*. (Vol. i, pp. 62, 63; Vol. iv, pp. 119, 187.

Tobacco. The tobacco of Venezuela is not only very superior to that of Virginia, but yields in quality only to the tobacco of the island of Cuba and the Rio Negro. The establishment of the *royal farm* in 1777, has prevented the opening of this important branch of commerce to the trade of Varinas, and of the vallies of Aragua and Cumanacoa. The total produce of the sale of tobacco at the beginning of the 19th century, was 600,000 piastres. (Vol. i, p. 57; Vol. iv, p. 166, and Vol. v, p. 368.) When the king of Spain, during the ministry of Don Diego Gardoqui, declared, by his *cédule* of September 30, 1792, that he would consent to deliver the country of the *farm* (*estanco*), it was proposed to substitute a general capitation on the monopoly of the fabrication of brandy from the sugar cane, (*aguardiente de cana*) or other taxes not less vexatious. These projects failed, and the *farm* of tobacco was continued.

Cerealia. The eastern and western parts of Columbia are often contrasted with each other from very vague and imperfect notions of the localities; it is affirmed that New Grenada is *a country of mines and wheat*, and that Venezuela is *a country of colonial productions*. In making these arbitrary distinctions the *tierra fria y templada*, is alone considered; that is, the countries of which the mean temperature * of the

* Between 800 and 1600 toises above the level of the sea. It may appear surprising that in equinoctial America, coun-

year is 13° and 18·5° cent. (the great mountainous table-lands of Quito, Los Pastos, Bogota, Tunja, Velez, and Leyva), forgetting that the whole northern and western part of New Grenada is a low and humid country, enjoying a mean temperature of 26° to 28°, and consequently fitted for the productions which in Europe are exclusively termed colonial. Venezuela (and I always intend to designate by that name the territory * of the ancient *Capitania-general* of Caraccas), has

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tries are called *cold*, of which the temperature of the year rises above that of Milan and Montpellier; but it must not be forgotten that in those cities the mean temperature of the summer is 22·8° and 24·3°; while at Quito, for instance, the days are generally during the whole year, between 15·6° and 19·3°, and the nights between 9° and 11°. The heat never rises beyond 22°; and the cold + 6° of the centigrade thermometer. The *tierras frias*, at the height of Santa-Fe (1365 toises), and Quito (1492 toises), have, during the whole year, the temperature of Paris in the month of May. As the division of heat at various times of the year is so different in the torrid and the temperate zones, in order to give an exact idea of the climate of any spot situated in the neighbourhood of the equator, the surest method is to compare it with the temperature of a month in the temperate region of Europe.

* The term Venezuela was employed in this sense at the installation of the congress at Angostura, February 15th, 1819, at which the deputies of Caraccas, Barcelona, Cumana, Varinas and Guyana were assembled. The maps of La Cruz and of Lopez use the terms, Province of Caraccas, and Venezuela, as synonimous. The captain-general, residing at Caraccas, and governing the country from the mouth of the Oroonoko as far as the Rio Tachira, was called *Capitan general de la Provincia de Venezuela y Ciudad de Caracas*. M. Depons, in his statistics, distinguishes the Capitania-general of *Caraccas*

also cold and temperate climates; it is a *country of bananas and of wheat.* The *cerealia* of Europe are already cultivated on the mountains of Merida and Truxillo (at la Puerta, and near St. Ana, on the south of Carachi), in the vallies of Aragua, near Victoria, and of San Matheo, and in the country, somewhat mountainous, between Tocuyo, Quibor, and Barquesimeto, which forms the *ridge of partition* between the streams which unite with the Apure and the Oroonoko, and those which fall into the Caribbean Sea. It is a fact worthy of particular attention, that wheat is cultivated in several of these places at a height that does not exceed 270 to 300 toises above the level of the sea, amidst the cultivation of coffee-trees, sugar-cane, and in places where the mean temperature of the year is at least 25°. In the equinoctial region of Mexico and New Grenada, the *cerealia* yield abundantly, only at 42° and 46° latitude, a height at which its cultivation ceases in Europe*; at Venezuela and in the Island of Cuba, on the con-

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from the government of Venezuela, which, according to him, comprehends only the province of Caraccas. The *Republic of Venezuela,* founded July 5th, 1811, and restored August 16th, 1813, was united to the Republic of Cundinamarca (Dec. 17th, 1819), by the name of Columbia, and since that union the name of Venezuela has been again officially restrained (Feb. 1822) to a *department* comprehending the provinces of Caraccas and Varinas. Amidst these fluctuations there is a risk of confounding a country twice as large as Spain, with another less than the state of Virginia, if the precise sense in which the word Venezuela is employed, be not determined. Regarding this name as identical with that of *Capitania-general of Caraccas,* we obtain a collective designation for the whole eastern part of Columbia, and we may say *Venezuela,* as we do Mexico, Chili, or Peru.

* At 900 and 1100 toises elevation; the fields of wheat and rye disappear in the maritime Alps and in Provence. See the

trary, the *lower limit* of wheat descends, in the most unexpected manner, towards the burning plains of the coast. Hitherto the production of the *cerealia* at Venezuela has been of small importance; it does not amount at Barquesimeto and Victoria to more than 12,000 quintals a year; and as the same places, being but little elevated, are also fit for the culture of the sugar-cane, of coffee, and cotton, that of wheat has not been able to obtain any considerable increase.

It is not the province of Caraccas alone that, in Venezuela, contains *regions of temperate climates*; that is, countries where the centigrade thermometer falls at night below 16° or 14°, and even to 12· 5°. The province of Cumuna has also its mountainous districts, which, though little visited hitherto, may yet become important for some new branches of equinoctial agriculture. Having passed through a great part of Venezuela with the barometer in my hand, I think it proper to state here succinctly the countries that merit the name of *tierras templadas* *, many of which, well-fitted for the production of *cerealia*, are too cold for the culture of coffee. This enumeration having merely an agricultural view, we shall mark only the high vallies or table-lands of a considerable extent. The Paramo of Mucuchies, which belongs to the *Sierra nevada* of Merida, the Silla of Caraccas, in the Cordilleras of the shore, and the Duida, in the missions of the Upper Oroonoko, are 2100, 1340, and 1280 toises high, but

researches on the temperature required for cultivated plants, in my work on *Distributions geog. plant.* 1817, p. 161.

* I should here mention that in adopting the somewhat vague denominations of *tierras, calientes, templadas*, and *frias*, I fix the first between the coast and the elevation of 300 toises; the second, between 300 and 1100 toises; and the third, between 1100 and 2460 toises. The last number, that of the limit of perpetual snows, indicates, in the equinoctial region, the cessation of vegetable life.

there are scarcely any spots on the declivities of these mountains capable of being cultivated. The same is the case with respect to the range of lofty secondary mountains of limestone, of mica-slate, and gneis-granite, that extend along the coast of Venezuela, from Cape Paria towards the lake of Maracaybo. This chain of the coast has not a sufficient mass to furnish those extensive table-lands which in Quito and Mexico unite the whole cultivation of Europe. The *lands with temperate climates*, (consequently above 300 toises,) of the ancient *Capitania-general* of Caraccas, are 1st. the mountainous part of the missions Chaymas * in New Andalusia; that is, the Cerro del Impossible (297 toises), the savannahs of Cocollar and Tumiriquiri (400-700), the vallies of Caripe (412 toises), and of la Guardia de San Augustin (533 toises): 2d. the declivities (*faldas*) of Bergantin †, between Cumana and Barcelona, the height of which is not exactly known, but appears to exceed 800 toises: 3d. the small table-land of Venta-grande, between La Guayra and Caraccas (765 toises): 4th. the valley of Caraccas ‡, (460 toises): 5th. the mountainous and arid country between Antimano and the Hacienda del Tuy, or the Higuerote and Las Cocuyzas §, are nearly 850 toises high; 6th. the granite table-lands || of Yusma, (320 toises) Guacimo, Guiripia, Ocumare, and Panaquire, between the Llanos and the southern range of the mountains on the shore of Venezuela; 7th. the dividing ridge between the tributary streams of the Caribbean Sea and the Apure, or the groupe of table-lands and hills 350 to 500 toises high, which connect the chain ¶ of the shore with the Sierra de Merida and

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* Vol. iii. p. 69, 86—119, 162, 163.

† Vol. ii. p. 204, 205; Vol. iii. p. 94, 95.

‡ Vol. iii. p. 394, 447.

§ Vol. iv. p. 79, 80.

|| Vol. iv. p. 269.

¶ Vol. iv. p. 248.

the Truxillo; namely, Montana de Santa Maria, west of Torito, el Picacho de Nirgua, el Altar, and the vicinity of Quibor, Barquesimeto, and Tocuyo: 8th. the table-land of Truxillo (above 420 toises); and the *tierras frias* of Paramos de las Rosas, Boconò and Niquitao, between the sources of the Rio Motatan, and those of the Portuguesa and the Guanare: 9th. the whole mountainous land that surrounds the *Sierra nevada* of Merida, between Pedraza, Lavellaca, Santo Domingo, Macuchies, the Paramo de los Conejos, Bayladores, and La Grita (700-1600 toises): 10th. some spots, perhaps of the Cordillera de Parime, which separates the basin of the Lower Oroonoko from that of the Amazon; the groupe of the granitic mountains of Sipapo and the Sierra Maraguaca *.

Not having visited with Mr. Bonpland the cold region of the province of Varinas, the declivity of the Sierra Nevada of Merida, and the *Paramos* at the north of Truxillo, which, according to the analogy of the observations I made in the Andes of Pasto and Quito, must be 1700 and 2100 toises high, I cannot judge of the extent of the vallies and table-lands which the western regions of Venezuela may one day furnish for the culture of the *cerealia* of Europe. It is not, as we have observed above, the knowledge of the absolute height of the peaks which can enlighten us respecting the problems of agriculture. Where the spots lying beneath the benign influence of a temperate or cold climate are on declivities too steep to be easily ploughed, the price of native flour would be too high to be brought into competition with the flour of the United States, of Mexico, and Cundinamarca. As in our Mediterranean, Italy and Greece have long drawn their corn from the opposite coast of Mauritania and Egypt, so also in the Mediterranean of America, Venezuela and the shore of New Grenada now receive their supply of flour from the opposite coast of the United States†. Don Manuel Torres,

* Vol. v. p. 554, 555, 605, 606.

† Itinerary manuscripts of M. Palacio Faxardo.

in an official letter addressed to the Secretary of State at Washington, estimates the exportation of North American flour for Columbia at 20,000 barrels a year. (*Message from the President of the United States,* 1822, p. 48. See also above, Vol. iv, p. 104, 105, and 111, 112.) In a state of free trade, the immense progress of the art of navigation exposes the native cultivation to a dangerous rivalry with that of the most distant countries. The fields of the Crimea supply the markets of Leghorn and Marseilles; the United States furnish Europe with corn, and in times of scarcity the table-land of Mexico sends its produce to Spain, Portugal, and England. Regions, some of which scarcely produce the 6th or 7th, and others the 20th or 25th grain, are placed in competition with each other, and the problem of the utility of a production is complicated by the variable effects of the fertility of the soil, and the price of labour. The western part of Columbia (New Grenada), will always possess great advantages with respect to the production of the cerealia, by the magnitude of its mountains, and the extent of its table-lands, over the eastern part of Columbia (Venezuela); it thence results that the rivalry of the flour of Socorro and of Bogota, which goes down by the Meta, will be to be divided by the regions north of the Oroonoko. Where temperate regions are in the vicinity of hot, between 300 and 500 toises high (as in the temperate spots of the provinces of Cumana and Caraccas), the cultivation of sugar, of coffee, and of the cerealia is equally practicable, and experience proves, pretty generally, that the cultivation of the two former is preferred as being the most lucrative.

Quinquina. The Cuspar, or *Cortex Angosturæ,* falsely called the quinquina of the Oroonoko, has become famous by the industry of the Catalan-Capucin monks. It is not a Rubiacée like the Cinchona, but a plant of the family of Diosmés, or Rutacés. This precious plant has hitherto been exported only from the Spanish Guyana, though it is also

found in Cayenne. (Vol. v. 767.) We are yet ignorant to what genus the Cuspa, or *quinquina of Cumana* belongs, but its properties being eminently febrifuge, it may become an important object of trade. (Vol. iii. p. 27.) Five species of real quinquina (*Cinchonæ, corollis hirsutis*), so common in New Grenada, have been discovered in the western part of Venezuela. The febrifuge-bark of the quinquina (*buenas quinas*, or *cascarillas*) is gathered on both the declivities of the *Sierra Nevada* of Merida, on the road from Varinas-viejas to Paramo de Mucuchies, called the road of Los Callejones, a little above the ravine of Lavellaca; and also between Viscucuy and the town of Merida *. These are all the real quinquinas (*Cichonæ*) that have hitherto been found principally on the coast of Spanish America. No species of Cinchona is yet known, not even of the kindred genus, Exostema, either in the mountains of the Silla de Caraccas, where the Befaria, Aralia, Thibaudia, and other alpine shrubs of the Cordilleras of New Grenada vegetate, nor in the mountains of Tumiriquiri and Caripe, and French Guyana †. This total absence of the Cinchona and Exostema on the table-land of Mexico, and in the oriental regions of South America, north of the equator, (if it be as absolute as it has hitherto appeared,) is the more surprising as the West Indies are not destitute of quinquina with smooth corolla and projecting stamina. In the southern hemisphere, the temperate parts of Brazil also, have yet only furnished the botanic traveller with one species of real Cinchona, a kind separated in a

* See above, Vol. iii, p. 29, 30; Vol. iv, p. 248; Vol. v. p. 767. *Lambert, Illustration of the genus Cinchona*, 1821, p. 57. The pretended Cinchona Brasiliensis of the Herbal of Willdenow, with a calice of the length of the corolla, and vegetating in the hot regions of Grand Para, is perhaps only a Machaonia.

† See the note G at the end of the 9th book.

striking manner by its fruit from the Macrocnemums. According to the fine discovery of M. Auguste de St.-Hilaire, the *Cinchona ferruginea* is found in the temperate regions of the *Capitania* of Minas Geraes, where it is employed under the denomination of *quina de serra*.

In concluding this sketch of the vegetable productions of Venezuela, that may one day become objects of traffic, I shall name succinctly the Quassia Simaruba of the valley of Rio Caura; the Unona febrifuga of Maypures, known by the name of *Frutto de Burra*; the Zarza or sarsaparilla of the Rio Negro; the oil of the cocoa-tree, which may be considered as the olive-tree of the province of Cumana; the oily almonds of Juvia (Bertholletia); the resins and precious gums of the Upper Oroonoko (*Mani, Carana*); the caoutchouc similar to that of Cayenne*, or subterranean (*dapiche*); the aromatics of Guyana, such as the *Tonga bean* or fruit of Coumarouma; the *Pucheri* (Laurus Pichurim); the *Varinacu*, or false cinnamon (*L. Cinnamamoides*); the vanilla of Turiamo, and the great cataracts of the Oroonoko; the fine colouring substances which the Indians reduce to a paste, (*Chica* or *Puruma*); the *brésillet*; Dragon's blood; *l'aceyte de Maria*; the nourishing raquelles (Cactus), the cochineal of Carora: the precious wood for the cabinet-maker, such as mahogany (*caoba*), the cedrela odorata (*cedro*), the Sickingia Erxthroxylon (red *Aguatire*) &c.; the noble timber of the family of the Laurinia, and the Amyris; and the cordage of the palm-tree *Chiquichiqui*, so remarkable for its lightness. (See above, Vol. iii. pp. 74, 200, 278; Vol. iv. pp. 78, 246, 255, 513, 553; Vol. v. pp. 162, 257, 284, 374, 378, 536, 544.

We have stated above in what manner, by a peculiar disposition of the lands, the three zones of agricultural, pastoral, and hunting-life, suc-

* Vol. iii. p. 423.

ceed each other in Venezuela from the north to the south along the coast towards the equator. Advancing in this direction, we may be said to traverse, in point of space, the different stations by which the human race has passed in the lapse of ages, in its progress towards cultivation, and in laying the foundations of civil society. The region of the shore is the centre of agricultural industry; the region of the Llanos serves only for the pasturage of the animals which Europe has given to America, and which live there in a half-savage state. Each of those regions contains from seven to eight thousand square leagues; further south, between the delta of the Oroonoko, the Cassiquiare, and the Rio Negro, lies a vast extent of land as large as France, inhabited by hunting nations, *horrida sylvis, paludibus fœdâ.* The productions of the vegetable kingdom which we have just enumerated belong to the zones at each extremity; the intermediary savannahs into which oxen, horses, and mules have been brought, since the year 1548, feed some millions of those animals. At the period of my travels, the annual exportation of Venezuela to the West India islands amounted to 30,000 mules, 174,000 ox hides, and 140,000 *arrobes* (of 25 pounds) of *tasajo* * or dried meat a little

* The meat on the back is cut in slices of moderate thickness. An ox or cow, of the weight of 25 arrobes, produces

salted. It is not from the advancement of agriculture, or the progressive encroachments on the pastoral lands, that the *hätes* have diminished so considerably within twenty years, but rather from the disorders of every kind that have prevailed, and the want of security for property. The impunity extended to the skin-stealers, and the accumulation of vagabonds in the savannahs, preceded that destruction of the cattle which the successive wants of armies, and the inevitable ravages of civil war have so deplorably increased. A very considerable number of goat-skins is exported to the Island of Marguerite, Punta Araya, and Corolas; sheep abound only in Carora and Tocuyo *. The consumption of meat being immense in this country, the diminution of animals has a greater influence than in any other district on the well-being of the inhabitants. The town of Caraccas, of which the population in my time was one-tenth of that of Paris, consumed more than half the quan-

only 4 to 5 arrobes of *tasajo* or *tásso*. In 1792, the port of Barcelona alone, exported 98,017 arrobes to the Island of Cuba. The average price is 14 *realés de plata*, and varies from 10 to 18. (There are 8 realés in a piastre.) Mr. Urquinasa estimates the total exportation of Venezuela in 1809, at 200,000 arrobes of *tasajo*.

* See above, Vol. i, p. 237; Vol. iii. p. 361, 365; Vol. iv, p. 210, 338, 341, 388; Vol. v. p. 75, 715, 802, 803.

tity of beef annually used in the capital of France *.

I might add to the productions of the vegetable and animal kingdoms of Venezuela the enumeration of the minerals, the working of which is worthy the attention of the government; but having been devoted from my youth to the practical labours of mines, which had been placed under my management, I know

* The following table proves how great is the consumption of meat in the towns of South America, near the Llanos :—

Towns.	*Years.*	*Population.*	*Oxen.*
Caraccas	1799	45,000	40,000
Nueva Barcelona.....	1800	16,000	11,000
Portocabello	1800	9,000	7,500
(Paris	1819	714,000	70,800)

The consumption at Mexico, of which the population is four or five times less than that of Paris, does not exceed 16,300 oxen; consequently it does not appear much greater than at Paris; but we must not forget, 1st, that Mexico is situated on a table-land cultivated with corn, and far from pasturage; 2d, that this town reckons nearly one-fourth of copper-coloured Indians among its inhabitants, who eat little meat; and 3d, that the consumption of sheep is 273,000†, and of hogs at Mexico is 30,000; while at Paris, notwithstanding the enormous difference of population, it was in 1819 only 329,000 of the former, and 65,000 of the latter. See above, Vol. iii, p. 464, 465; Vol. vi. p. 76, and my *Political Essay on New Spain*, Vol. ii, p. 684. *Recherches stat. sur la ville de Paris, par le comte de Chabrol*, 1823, *tableau* 72.

† According to the statement given in this Work by the Author, the consumption of sheep at Mexico was 278,923, and of hogs, 50,676.—*Trans.*

how vague and uncertain are the judgments we form of the metallic wealth of a country from the mere appearance of the rocks, and of the veins in their beds. The utility of such labours can be determined only by well directed attempts by means of shafts or galleries. All that has been done in researches of this kind, under the dominion of the mother country, has left the question wholly undecided, and the most exaggerated ideas have been recently spread through Europe, with very culpable levity, concerning the riches of the mines of Caraccas. The common denomination of Columbia given to Venezuela and New Grenada, has, no doubt, contributed to facilitate those illusions. It cannot be doubted that the gold-washings of New Grenada furnished, in the last years of public tranquility, more than 18,000 marks of gold; that Choco and Barbacoas furnish platina in abundance; the valley of Santa Rosa, in the province of Antioquia, the Andes of Quindiu and Gauzum, near Cuença, sulphurated mercury; the table-land of Bogota (near Zipaquira and Canoas), fossile-salt and pit coals; but even in New Grenada, real subterranean labors, on the silver and gold veins, have hitherto been very rare *. I am far, however, from wishing to discourage the miners of those countries; I merely conceive that it is not necessary, in order to

* *Political Essay on New Spain*, Vol. iii, p. 299 and 379.

prove to the old world the political importance of Venezuela; the amazing territorial wealth of which is founded on agriculture and the produce of pastoral life; to describe as realities, or as the conquests of industry, what is, as yet, founded solely on hopes, and probabilities more or less uncertain. The republic of Columbia possesses also on its coast, on the Island of Marguerita, on the Rio Hacha, and in the gulf of Panama, pearl fisheries of ancient celebrity. In the present state of things, however, these pearls are as insignificant an object as the exportation of the metals of Venezuela. The existence of metallic veins on several points of the coast cannot be doubted. Mines of gold and silver were worked, at the beginning of the conquest, at Buria, near Barquesimeto, in the province of Los Mariches, Baruta, on the south of Caraccas, and at Real de Santa Barbara, near the Villa de Cura. Grains of gold are found in the whole mountainous territory between Rio Yaracuy, the Villa de San Felipe and Nirgua, as well as between Guigue and los Moros de San Juan. Mr. Bonpland and myself, during our long journey, saw nothing in the gneis-granite of Spanish Guyana to confirm the ancient belief of the metallic wealth of that district; yet it seems certain, from several historical indications, that there exist two groupes of auriferous alluvial land; one, between the sources of

the Rio Negro, the Uaupes and the Iquiare; the other, between the sources of the Essequebo, the Caroni, and the Rupunuri. I flatter myself that, if the government of Venezuela should ever make a thorough examination of the principal metallic beds of its soil, the persons to whom those researches are confided, will find in the 13th, 16th, 17th, 24th, and 27th chapters of this work, geognostic notions which may be useful to them, because they are founded on a detailed knowledge of the localites *. Hitherto only one working is found in Venezuela, that of Aroa; it furnished, in 1800, near 1500 quintals of copper of an excellent quality. The greenstone rocks of the passage mountains of Tucutunemo (between Villa de Cura and Parapara) contain veins of malachite and copper pyrites. The indications of both ocherous and magnetic iron in the coast chain, the native alum of Chuparipari, the salt of Araya, the kaolin of Silla, the jade of the Upper Oroonoko, the petrolium of Buen-Pastor, and the sulphur of the eastern part of New Andalusia, equally merit the attention of the administration †.

It is easy to ascertain the existence of some mineral substances, which afford hopes of a lu-

* Vol. iii, p. 524—536; Vol. iv, 252, 269, 274, 470; Vol. v, 311, 342, 401, 507, 559, 809, 826, 852, 863.

† Vol. ii, p. 254—272; Vol. iii, p. 103—108, 204. Vol. iv, p. 51; and in the present volume, p. 103.

trative working, but it requires great circumspection to decide whether the abundance of mineral and the facility of reaching it, be sufficiently great to cover the expence *. Even in the eastern part of South America, gold and silver are found dispersed in a manner that surprizes the European geognost; but that dispersion, the divided and entangled state of the veins, and the appearance of some metals only in masses, render the working extremely expensive. The example of Mexico proves sufficiently that the interest attached to the labours of the mines is not hurtful to agricultural pursuits, and that those two kinds of industry may simultaneously promote each other. The inutility of the attempts made under the intendance of Don Jose Avalo must be attributed solely to the ignorance of the persons employed by the Spa-

* In 1800, a day-labourer (*peon*) employed in working the ground, gained, in the province of Caraccas, 15 sols, exclusive of his food. (Vol. iv, p. 128.) A man who hewed building timber in the forests on the coast of Paria, was payed at Cumuna, 45 to 50 sols a day, without his food. A carpenter gained daily from 3 to 6 francs, in New Andalusia. Three cakes of Cassara (the bread of the country), 21 inches in diameter, 1½ line thick, and 2½lb. weight, cost at Caraccas, a half-*real de plata* or 6½ sols. A man eats daily not less than 2 sols worth of cassara, that food being constantly mixed with bananas, dried meat (*tassajo*), and *papelon*, or unrefined sugar. Compare for the price of provisions, Vol. iv, p. 242, 388; Vol. v, 152.

nish government, and who gravely took mica and amphibol for metallic substances. If the government have the perseverance to cause the ancient *Capitania-general* of Caraccas to be examined during a long series of years, and is so fortunate as to choose men as distinguished as MM. Boussingault and Rivero, who are establishing at present a school of mines at Bogota, and who join to a solid knowledge in geognosy and chemistry, the practical habit of mining, the most satisfactory results may be expected.

Commerce and Public Revenue.—The description we have given above * of the productions of Venezuela, and the development of its coast, is sufficient to show the importance of the commerce of that rich country. Even amidst the shackles of the colonial system, the value of the exports of the products of agriculture, and of the gold-washings, amount to 11 or 12 millions of piastres, in the countries which are at present united under the denomination of the Republic of Columbia. The exports of the Capitania general of Caraccas alone, apart from the precious metals, which are the object of a regular working, was (with the contraband), from 5 to 6 millions of piastres, at the beginning of the 19th century. Cumana, Barcelona, La Guayra, Portocabello, and Mara-

* See above, pp. 181 and 200.

caybo, are the most important parts of the coast; those that lie most to the eastward have the advantage of an easier communication with the Virgin Islands, Gaudeloupe, Martinique, and St. Vincent. Angostura, the real name of which is Santo Tomè of Nueva Guyana, may be considered as the port of the rich province of Varinas. The majestic river, on the banks of which this town is built, furnishes, by its communications with the Apure, the Meta, and the Rio Negro, the greatest advantages for trade with Europe *.

In order to form a correct idea of the importance of Venezuela, with respect to its exports and imports of the productions of the old world, we must recur to a period of external peace, which preceded the revolution of Spanish America twelve or fifteen years. The trade of La Guayra was then in its greatest splendour. The following are the official results of the registers of the custom house, which throw some light on the commercial state of those regions, and which were not published by MM. Depons and Dauxion-Lavaysse, in their voyages to *Terra Firma*, and the *Isle of Trinity*.

I. Trade of La Guayra, in 1789.

Imports, value	1,525,905 piastres
Of which the duties paid	160,504
Exports, value	2,232,013
Of which the duties paid	167,458
A. Imports:	
Spanish Goods	777,555 piastres
Foreign	748,350

* See Vol. iv, p. 564; Vol. v, p. 512, 607, 680, 715.

B. Exports:

Gold and silver coin ..... 103,177 piastres
Produce 2,128,836
Among which;
Cotton ..... 170,427 pounds
Indigo 718,393
Tobacco 202,152
Cacao ..... 103,855 fanegas
Coffee ..... 23,371 pounds
Hides ..... 12,347 pieces
Buckskins 2,905
Marroquins 1,388

II. Trade of La Guayra, in 1792.

Imports, value ..... 3,562,311 piastres
Exports 2,315,692

A. Imports:

From the ports of America ..... 60,348 piastres
From Spain 1,855,278
From other parts of Europe .. 1,666,685

B. Exports:

	Indigo, Pounds.	Cotton, Pounds.	Cacao, Fanegas.	Coffee, Pounds.	Hides, Pieces.
For Spain - -	669,827	225,503	100,592	138,968	15,332
For Foreign Colonies - -	10,402	33,000	....	9,932	70,896
	680,229	258,503	100,592	148,900	86,228

III. Trade of La Guayra, in 1794.

A. Exports:

	Indigo, Pounds.	Cotton, Pounds.	Cacao, Fanegas.	Coffee, Pounds.	Hides, Pieces.
For Spain - -	875,907	431,658	111,133	307,032	5,305
For Foreign Colonies - -	22,446	....	....	57,606	49,308
	898,353	431,658	111,133	364,638	54,613

B. Imports:

a Merchandize and Provisions.		
Spanish	1,111,709	piastres
Foreign from Europe	868,812	
—— the United States	75,993	
—— the West Indies	13,415	
	2,069,929	
b Silver coin	60,000	
Total imports	2,129,929	

IV. Trade of La Guayra, in 1796.

A. Exports, value..... 2,403,254 piastres.

Namely:—

	INDIGO, Pounds.	COTTON, Pounds.	CACAO, Fanegas.	COFFEE, Pounds.	TOBACCO Pounds.	HIDES, Pieces	COPPER, Pounds.
For Spain - - -	709,135	483,250	70,280	482,000	454,723	1,531	31,142
For the United States - - -	132	....	5,258	162	....	....	....
For the Foreign W. India Islands	28,699	53,928	....	2,500	....	79,777	....
	737,966	537,178	75,538	484,662	454,723	81,308	31,142

B. Imports:

a From Spain, in national products	1,871,571	piastres
Foreign	1,429,487	
b From Foreign American Colonies	179,002	
Total importation	3,480,060	

Import and Export Duties, paid at the custom-house, amounted to..... 587,317 piastres

V. Trade of La Guayra, in 1797.

A. Exports, value ..... 1,113,695 piastres

Namely:—

	INDIGO, Pounds.	COTTON, Pounds.	CACAO, Fanegas.	COFFEE, Pounds.	TOBACCO Pounds.	SUGAR, Cases.	HIDES, Pieces.	COPPER, Pounds.
For Spain -	61,785	50,285	46,075	153,699	....	....	671	2,000
For the United States - -	2,256	....	4,024	....	....	738	....	....
For the Foreign W. I. Islands	56,894	57,711	20,733	155,813	175,719	638	286	400
	120,935	107,996	70,832	309,512	175,719	1,376	957	2,400

A. Imports, value:—

a From Spain ... . 98,388 piastres

b Foreign:

From the United States 76,568

—— the West Indies 389,844

Total imports ..... 564,800 piastres

Export and Import Duties, paid at the Custom House . . .. 242,160 piastres

In comparing these statements, which are taken from the registers of the custom-house at La Guayra, with those of the ports of Spain in my possession (Vol. iv, p. 240), we see that according to the declarations of the vessels, less cacao has entered Spain from Caraccas than from La Guayra. The diminution of the imports and exports in 1797, indicate no decline of national industry; it is the consequence of the renewal of maritime war, Spain having till then, since its peace with the French republic, enjoyed a happy neutrality. The registers of the Custom-house, which I have just stated, during four years, 1789, 1792, 1794, and 1796, give, for the average of the imports of La Guayra, which is the principal port of Venezuela, 2,678,000 piastres; and for the average of the exports, 2,317,000 piastres. If we fix on the years

1793—1796 only, we have for the exports 3,060,000 piastres, while the years of war, comprehended between 1796 and 1800, furnish an average of only 1,610,000 piastres. (*Depons*, Vol. ii, p. 439.) In the year 1809, and consequently only a short time before the revolution of Caraccas *, the balance of trade at La Guayra ought to have been little different from what it was in 1796. I discovered in a journal of Santa Fe de Bogota (*Semanario*, Vol. ii, p. 324), an official extract of the registers of the custom-house, for the first six months of

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* The following are the principal epochas of that revolution. The *supreme Junta* of Venezuela, who declared they would maintain the rights of Ferdinand VII, and who banished the captain-general and the members of the *Audiencia*, assembled 19th April, 1810. The *congress* which succeeded the supreme Junta, 2d March, 1811, declared the independance of Venezuela, 5th July, 1811. The congress held its sittings at Valencia, in the vallies of Aragua, in March, 1812. The earthquake that destroyed the greater part of the town of Caraccas, on the 26th March, 1812 (Vol. iv, p. 12), rendered the Spaniards again masters of the country in August, 1812. General Simon Bolivar retook Caraccas, and entered it in triumph, August 16th, 1813. The royalists became masters of Venezuela in July, 1814, and of Bogota, in June, 1816. In the same year, General Bolivar disembarked at the island of Marguerita, at Carupano, and at Ocumare. The second congress of Venezuela was installed at Angostura, February 15th, 1819. The *fundamental law* that unites Venezuela to New Grenada, by the name of the republic of Columbia, was proclaimed December 17th, 1819. The armistice, concluded between the Generals Bolivar and Morillo, is dated November 25th, 1820. The constitution of the Republic of Columbia dates August 30th, 1821. The government of the United States recognized that Republic, March 8th, 1822.

the year; during that period the imports from Spain were 274,205 piastres; from foreign parts, 768,705 piastres; total value of the imports, 1,042,910 piastres. The exports for Spain were 778,802 piastres; for foreign parts, 623,805; total value of the exports, 1,402,607 piastres. We may consequently regard 2,700,000 piastres as the mean term of the exports of the port of La Guayra at the beginning of the 19th century, in a year when the country enjoyed internal and external tranquillity *.

The ports of Cumana and Nueva Barcelona, at the period of the revolution, exported annually, (comprehending the produce of the illicit trade,) to the value of 1,200,000 piastres; in which were comprised 22,000 quintals of cacao, a million of pounds of cotton, and 24,000 quintals of salt meat. If we add to the exports of La Guayra, Cumana, and Nueva Barcelona, a million of piastres, as the produce of the trade of Angostura and Maracaybo, and 800,000 piastres as the value of the mules and oxen embarked at Portocabello, Carupano, and other small ports of the Atlantic, we shall find the total value of the produce exported in the an-

* I communicated many details respecting the merchandize registered in the custom houses of Spain, for the ports of *Terra Firma*, in 1795, to M. Dauxion-Lavaysse, which he inserted in his *Voyage à la Trinité*, Tom. ii, p. 464. I drew my information from a very instructive memoir of the Count de Casa Valencia, on the means of vivifying the trade of Caraccas. M. Urquinaona (*Relac. docum.*, p. 13), estimates the total of the exports of Venezuela, in 1809, at eight millions of piastres.

cient *Capitania-general* of Caraccas, to be more than six millions of piastres. It is very probable that the consumption of the provisions of Europe and of other parts of America reached nearly the same amount in the peaceful times which immediately preceded the revolution. As nothing is more vague than the pretended balances of trade founded on the custom house registers, and as we are ignorant whether the contraband trade with the West India Islands augments the value of registered articles, a quarter, a third, or a half, it is not uninteresting to verify the results we have just obtained by the partial estimate of the wants of the population. Now it is found, by minute calculations made on the spot, that the consumption of foreign productions* in the *Govierno* of Cumana, was, for each adult individual of the richest class, inhabiting towns, but 102 piastres yearly; for an adult slave, 8 piastres; for children, not indians, less than 12 years of age, $\frac{1}{4}$ piastre; for every adult indian, in the most civilized communes (*de doctrina*), 10 piastres; for a family of indians, composed of four persons entirely naked, such as they are found in the missions of

* *Informe de Don Manuel Navarete, Tesorero de la Real Hacienda en Cumana sobre el estanca de tabaco y los medios de su abolicion total* (Manuscript). In this reasoning on the consumption, the words *foreign articles* indicate all merchandize which is not originally of Venezuela.

Chaymas, 7 piastres. According to these statements, and supposing that in the two provinces of Cumana and Barcelona, there are only 86,000 inhabitants, of whom 42,000 are Indians; and adding the necessary annual expences for the embellishment and service of the churches, for the support of the religious communities, and the equipment of vessels, M. Navarete estimates the value of goods drawn from foreign parts at 853,000 piastres, which makes nearly 10 piastres for each individual, of every age and caste. It cannot be doubted that during the period of civil troubles, and by a more frequent contact with the nations of Europe, luxury has been prodigiously augmented in the populous towns of Venezuela; but the population of towns is in Spanish America but an inconsiderable fraction of the general population; and with the habits of sobriety maintained by the great mass who inhabit the country distant from the coast, I conceive that the 785,000 inhabitants, which we now attribute to Venezuela, will require, when the country shall enjoy perfect tranquillity, foreign productions to the value of more than seven millions of piastres.

I entreat such of my readers as love to employ themselves on financial considerations, to attend for a moment to these numerical results. Europe, overloaded with manufactures, seeks channels for the dispersion of the production of

her industry. Such is the state of dawning society in South America, that the population of Venezuela, which at most equals the mean population of two departments of France *, stands in need annually, for its interior consumption, of merchandize and foreign articles to the amount of 35 millions of francs. More than four-fifths of those articles come by different ways, from the markets of Europe. Yet, the population of Venezuela is poor, frugal, and little advanced in civilization. If, according to the statements of imports, it appears to have a great consumption, and feeds the industry of commercial nations by its wants, this arises from its being entirely destitute of manufactures, and that the most simple mechanical arts have scarcely begun to be practised there. The maroquins and curried hides of Carora, the hammocks of the Island of Marguerita, and the blankets of Tocuyo, are objects of very small importance even for the inland trade. All the fine tissues and coloured linens used at Venezuela come from foreign ports. When the commerce of France with the American colonies was most flourishing, before the year 1789, she exported to them to the amount of 80 millions of francs, in the productions of the French soil and industry. This amount is little more than that of the total value of the foreign consump-

* See above, p. 187, note *.

tion of Columbia. I dwell on the importance of these considerations, to prove how much the nations of the old world are interested in the prosperity of the free states that are forming in equinoctial America. If those states, whilst harassed from without, continue to remain agitated, a civilization which has not taken deep root will be gradually dstroyed; and the whole of Europe, without advantage to the mother country, which could neither tranquillize its colonies, nor permanently re-possess them, will be deprived, for a long period of time, of a market fitted to give life to trade and manufacturing industry.

I shall add to these considerations some statistical statements little known, taken from a very recent memoir of the *Consulado de la Vera Cruz.* This document shews that Venezuela by its entire want of manufactures, and the small number of its indian inhabitants, presents in proportion to the respective population, a greater consumption of foreign articles than New Spain. In a period of twenty-five years, from 1796 to 1820, the importation * from the

* In the commercial register published at Vera-Cruz, the imports and exports made on account of the government are not included. For instance, in the year 1802, the extent of trade (the same of the exports and imports), is indicated at 60,445,955 piastres. If to this had been added the amount of 19½ millions of piastres embarked on the king's account,

port of Vera-Cruz, according to the registers of the custom-house, amounted to 259,105,940 piastres, of which 186,125,113 piastres were from the mother country. The consumption of New Spain in European articles, during the same period, was 224,447,132 piastres, or 8,977,885 piastres annually. We are struck with the smallness of this sum, compared with the wants of a population of 6 millions of souls; and therefore the secretary of the *Consulado de la Vera-Cruz*, M. Quiros, concludes that the contraband exportation rose, taking one year with another, to more than 12 or 15 millions of piastres. According to these calculations, made by persons who have a perfect knowledge of the localities, Mexico must consume at the utmost, in its present state, foreign articles of the value of 21 to 24 millions of piastres, that is, with a population eight times greater, not four times as much as the ancient *Capitania-general* of Caraccas. So great a difference between two markets open to the trade of Europe, on the coasts of Mexico and Venezuela, will, I believe, appear less extraordinary, if we recollect that among the 6,800,000 inhabitants of New Spain, there are more than 3,700,000 indians of an un-

and the value of mercury and paper for cigares, received on account of the *Real Hacienda*, the extent of trade, in 1802, would have been 82,077,000 piastres; and in 1803, it would have been 43,897,000 piastres instead of 37,379,637.

mixed race *, and that the manufacturing industry of that fine country is already so much advanced that the value of its home fabrics in wool and cotton, in 1821, amounted to 10 millions of piastres per annum †. In deducting the indian population, whose wants are almost entirely restricted to the productions of the soil, from the total population of Venezuela and Mexico, we find in the former country, that the consumption of the productions of foreign industry, amount to 10 piastres, and in the latter, to 8 piastres for every individual of all ages and both sexes. These results shew, that when we consider the great masses only, the state of society appears nearly the same in the most distant parts of Spanish America, notwithstanding the varying influence of physical and moral causes.

The shores of Venezuela from the beauty of their ports‡, the tranquillity of the sea by which

* (See my *Political Essay on New Spain*, Vol. iv, p. 127). During the 25 years that preceded the year 1820, gold and silver were coined at Mexico to the value of 429,110,008 piastres. See above. p. 129.

† *Balanza del Comercio reciproco hecho por el puerto de Vera Cruz coo los de España y de America en los ultimos 25 años. (De orden del Consulado de Vera Cruz, el 18 de Abril 1821.)*

‡ The following is the series of anchorage, roads, and ports with which I am acquainted, from Cape Paria as far as Rio del Hacha; Ensenada de Moxillones; the mouth of the Rio Caribes; *Carupano*; Cumana (See above, Vol. ii, page

they are washed, and the fine ship timber that covers them, possess great advantages over the shores of the United States. In no part of the world is there found firmer anchorage, or fitter positions for the establishment of military posts. The sea of this coast is constantly calm, like that which extends from Lima to Guayaquil. The storms and hurricanes of the West Indies are never felt on the *Costa firme;* and when after the sun has passed the meridian, thick clouds loaded with electricity, accumulate on the mountains of the coast, this threatening aspect of the sky denotes to a pilot accustomed to those latitudes, only a squall that scarcely obliges him to reef or take in the sails. The virgin-forests near the sea, in the eastern part of New Andalusia, present valuable resources for

211); Laguna Chica, on the south of Chuparuparu (Vol. vi, p. 97); *Laguna grande del Obispo* (Vol. iii, p. 21; Vol. vi, p. 108); Cariaco, (Vol. iii, p. 198); Ensenada de Santa-Fe; Puerto Escondido; *Port de Mochima* (Vol. iii, p. 358; Vol. vi, p. 108); Nueva Barcelona (Vol. iii, p. 361; Vol. vi, p. 77); the mouth of the Rio Unare; Higuerote (Vol. iii, p. 370; Chuspa; Guatire; *La Guayra* (Vol. iii, p. 382); Catia; Los Arecifes; Puerto la Cruz; Choroni; Sienega de Ocumare; Turiamo; *Burburata;* Patenebo (Vol. iii, p. 402); *Porto Cabello* (Vol. iv, p. 201); Chichiribiche (Vol. iv, p. 204); Puerto del Manzanillo; *Coro; Maracaybo;* Bahia Honda; El Portete et Puerto Viejo; the island of Margueríta has three good ports, Pampatar, Pueblo de la Mar, and Bahia de Juan Griego. (*Those printed in Italics are the ports most frequented.*)

the establishment of dock yards. The wood of the mountain of Paria may vie with that of the Islé of Cuba, Huasacualco, Guayaquil, and San Blas. The Spanish government had, at the end of the last century, fixed its attention on this important object. Marine engineers were sent to mark the finest trunks of Brazil-wood, mahogany, cedrela, and laurinea, between Angostura and the mouth of the Oroonoko, as well as on the banks of the gulf of Paria, vulgarly called *Golfo triste*. It was not intended to establish dock and yards on the spot, but to hew the weighty timber into the form necessary for ship building, and to transport it in the king's ships to Caraque, near Cadiz. Although trees proper for masts are not found in this country, it was yet hoped that the execution of this project would considerably diminish the importation of timber from Sweden and Norway. The establishment was attempted in a very unhealthy spot*, in the valley of Quebranta, near Guirie; I have already mentioned in another place, the causes of its destruction. The insalubrity of the place would, doubtless, have diminished in proportion as the forest *(el monte virgen)* would have been removed from the dwellings of the inhabitants. Mullattoes, and not whites, ought to have been employed in

* Vol. iii, p. 83.

hewing the wood, and it should have been remembered that the expence of the roads *(arastraderos)*, for the transport of the timber, when once traced, would not have been the same, and that, by the increase of the population, the price of day labour would progressively have diminished. It belongs to ship-builders alone who know the localities, to judge, whether in the present state of things, the freight of merchant vessels be not far too dear to allow of sending large quantities of wood roughly hewn, to Europe; but it cannot be doubted that Venezuela possesses on its maritime coast, as well as on the banks of the Oroonoko, immense resources for ship building. The fine ships which have gone out of the yards of the Havanah, Guayaquil, and San Blas, have, no doubt, cost more than those constructed in Europe, but from the nature of tropical wood, they possess the advantage of hardness and amazing durability.

We have just analysed the objects of commercial industry at Venezuela and their immense value; it remains to take a view of the *means of commerce* which are found in a country destitute of high roads, and wheel carriages, and restricted to internal and external navigation. The uniformity of temperature that prevails in the greater part of these provinces, causes such an equality in the agricultural pro-

ductions necessary to life, that the want of exchanges is there felt less than at Peru, Quito, and New Grenada, where the most opposite climates prevail on a small space of land. The flour of the cereals is almost an object of luxury for the great mass of the population, and every province participating in the possession of the Llanos, that is of pasturages, draws its nourishment from its own soil. The inequality of the harvest of maize, varying according as rain is more or less frequent; the transportation of salt, and the prodigious consumption of meat in the most peopled districts, lead, no doubt, to exchanges between the Llanos and the coast; but the great and real object of commercial activity in the interior of Venezuela, is the carriage of products to be exported to the West Indies and to Europe; such as cacao, cotton, coffee, indigo, dried meat, and hides. It is singular, that, notwithstanding the great number of horses and mules that wander in the Llanos, no use is yet made of those great waggons which have for ages traversed the Pampas, between Cordova and Buenos-Ayres. I did not see one in a single waggon on Terra Firma; the conveyance of goods is all made on the back of mules, or by water. A road, however, might be easily traced, fitted for wheel carriages, from Caraccas to Valencia, in the vallies of Aragua, and thence by the Villa de Cura to the Llanos

of Calabozo, as well from Valencia to Portocabello, and from Caraccas to La Guayra. The *Consulados* of Mexico and Vera Cruz have known how to vanquish difficulties a hundred-fold greater, in constructing the fine roads from Perote to the coast, and from the capital to Toluca.

With respect to the internal navigation of Venezuela, it would be useless to repeat here what we have stated above, on the branchings and communications of the great rivers; we shall confine ourselves to direct the attention of the reader to the two great *navigable lines* that exist from east to west (by the Apure, the Meta, and the Lower Oroonoko), and from south to north, by the Rio Negro, the Cassiquiare, the Upper, and the Lower Oroonoko. By the first of these lines the productions of the province of Varinas* flow towards Angostura, by the Portuguesa, Masparro, the Rio Santo-Domingo, and the Orivante; and the productions of the province of Los Llanos, and the table-land of Bogota†, by the Rio Casanare, the Crabo, and the Pachaquiaro. The second line of navigation, founded on the bifurcation of the Oroonoko, leads to the most southern extremity of Columbia, to San Carlos del Rio Negro, and the Amazon. In the present state of Guyana, the

* Vol. iv, p. 389, 454.

† Vol. iv, p. 564—569.

navigation to the south of the Great Cataracts*, of the Oroonoko, is scarcely any thing, and the utility of inland communications either with Para, the mouth of the Amazon, or the Spanish Provinces of Jean and Maynas, is founded only on vague hopes. These communications are, in respect to Venezuela, what those of Boston and New York are in respect to the inhabitants of the United States with the coast of the Pacific ocean, across the rocky mountains. In substituting a canal of 6000 toises, for the portage of Guapore †, a line of inland navigation would be opened from Buenos-Ayres to Angostura. Two other canals of easier construction, might join, the one might unite Atabapo to the Rio Negro ‡ by the Pimichin, rendering it unnecessary for the boats to go round by the Cassiquiare; and the other would do away with the dangers of the rapids of Maypures §. But I repeat, that all the commercial views that are directed to the south of the Great Cataracts, belong to a state of civilization as yet very distant, and in which the four great tributary streams of the Oroonoko (the Carony, the Caura, the Padamo, and the Ventuari), || will become

* Atures and Maypures.

† Vol. iv, p. 305.

‡ Vol. v, p. 166.

§ Vol. v, p. 260.

|| Vol. v, p. 512. 606. See also Vol. v, p. 216, on the importance of the Guaviare; Vol. v, p. 479, on the isthmus

no less celebrated than the Ohio and the Missouri, on the west of the Alleghanis. At present, the line of navigation from west to east alone engages the attention of the inhabitants, and even the Meta does not yet possess the importance of the Apure and the Rio Santo Domingo. On that line *, 300 leagues in length, the use of steam boats would be of the greatest utility to go up from Angostura to Torunos, the port of the rich province of Varinas. It is dif-

of Rupumiri, and the portages between the Rio Branco, the Essequebo, and the Carony; and Vol. v, p. 572, on the road by land leading from the Upper to the Lower Oroonoko, and from the Esmeralda to the Erevato, *Ib.*

* The title of a book that has recently appeared (*Journal of an Expedition* 1400 *miles up the Oroonoko, and* 300 *up the Arauca, by H. Robinson*, 1822), singularly exaggerates the length of the Lower Oroonoko, and its western tributary streams. A voyage of 1700 English miles would have led the author far into the South Sea. A much more extraordinary geographical error is found in a work composed almost entirely of passages extracted from my *Personal Narrative*, and accompanied with a map which bears my name, although I there search in vain for the town of Popayan. In this *Geographical, statistical, agricultural, commercial, and political account of Columbia*, (1822), it is said Vol. ii, p. 28, that "the Cassiquiare, long believed to be an arm of the Oroonoko, has been found by M. de Humboldt to be an arm of the Rio Negro." The same assertion is repeated in the *Vollständige, Hondbuch der neueren Erdbeschreiung*, Vol. xvi, p. 48, written by a man of great merit, Mr. Hassel. Yet, nearly 23 years ago I went up the Cassiquiare, in the direction of from south to north.

ficult to form an idea of the muscular force exerted by the boatmen, whether they tow their barks, or push their oars (*palanca*) against the bank*, in going up the Apure, the Portuguesa, or the Rio de Santo Domingo, at the time of the high floods. The Llanos present a ridge of partition so little elevated, that between the Rio Pao and the lake of Valencia, as well as between the Rio Mamo and the Guarapiche, communications might be opened by canals, and join, for the facility of inland trade, the basin of the Lower Oroonoko to the coast of the Atlantic and the gulf of Paria†.

United with the local interest of the internal navigation of Venezuela, is another intimately connected with the prosperity of the commercial nations of both hemispheres. Among the five points that appear to present the practicability of opening a direct navigation between the Atlantic ocean and the South sea, three are found in the territory of Columbia. I will not here repeat what I have already observed on this important object, in the first volume of the *Political Essay on New Spain*‡; where I have

* There are windings (*vueltas*) in the Portuguesa and the Apure, and counter-forts that sometimes retain boats a whole day.

† Vol. iv, p. 150; Vol. vi, p. 46.

‡ Vol. i, p. cv. 16, &c; Vol. iv, p. 17. See also my *Atlas Géogr. et Physique de la Nouvelle Espagne*, pl. 15.

shewn that previously to undertaking any labours on either of those points, they ought all to be examined. It is only by investigating an hydraulic problem in its greatest generality, that it can be advantageously solved. Since I left the New Continent no barometric measure or geodesic levelling has been executed to determine the lines of elevation which the projected canals ought to traverse. The different works that have appeared during the war of independence of the Spanish colonies, are confined to the same ideas *, which I published in 1800;

* I except the useful information given by Mr. Davis Robinson, on the anchorage of Huasacualco, Rio San Juan and Panama. Memoirs on the Mexican Revolution, 1821, p. 263. (See also Edinb. Rev., Jan. 1810. *Walton* in the *Colonial Journal*, 1817, March and June. *Bibl. Universelle de Genève*, Jan. 1823, p. 47; *Bibliotica Americana*, Vol. 1, p. 115—129.) "The bar at the mouth of the Rio Huasacualco has 23 feet of water; there is good anchorage, and the port can admit the largest ships. The bar of the Rio San Juan, on the eastern coast of Nicaragua, has 12 feet of water; on one point only there is a narrow pass 25 feet deep. In the Rio San Juan there is from 4 to 6 fathoms, and in the lake of Nicaragua from 3 to 8, English measure. The Rio San Juan is navigable for brigs and sloops." Mr. Davis Robinson also says "the western coast of Nicaragua is not so stormy as it was represented to me during my navigation in the South Sea, and a canal issuing at Panama would have the great disadvantage of being continued at a distance of two leagues *in the sea*, because there are only some feet of water as far as the isles Flamengo and Perico."

it is only by the communications which I have since held with the inhabitants of regions the least visited, that I have been able to obtain some new information. I shall here state the considerations that are most important for the political advantage and the trade of the nations.

The five points that present the practicability of a communication from sea to sea, are situated between the 5th and 18th degrees of north latitude. They all, consequently, belong to the states washed by the Atlantic, to the territory of the Mexican and Columbian confederations, or, to use the ancient geographical denominations, to the intendancies of Oaxaca, and Vera Cruz, and the provinces of Nicaragua, Panama, and Choco. They are:—

The Isthmus of Tehuantepec (lat. 16°-18°), between the sources of the Rio Chimalapa and the Rio del Passo, which empties itself into the Rio Huasacualco or Goazacoalcos.

The Isthmus of Nicaragua (lat. 10°-12°), between the port of San Juan de Nicaragua, and the coast of the gulf of Papagayo, near the volcanos of Granada and Bombacho.

The Isthmus of Panama (lat. 8° 15′-9° 36′.)

The Isthmus of Darien, or Cupica (lat. 6° 40′-7° 12′.)

The Canal of Raspadura, between the Rio Atrato and the Rio San Juan of Choco, (lat. 4° 58′-5° 20′.)

Such is the happy position of these five points, of which the latter will probably be always confined to the *system of small navigation*, or inland communications, that they are placed at the centre of the New Continent, at an equal distance from Cape Horn and the north-west coast, celebrated for the fir trade. Opposed to each (in the same parallel), are the seas of China and India, an important circumstance in latitudes where the trade-winds prevail; all are easily entered by vessels coming from Europe and the United States.

The most northern isthmus, that of Tehuantepec, which Hernan Cortez, in one of his letters to the Emperor Charles 5th (of the 30th October, 1520), calls the *secret of the strait*, has so much the more, of late years, fixed the attention of navigators, that during the political troubles of New Spain, the trade of Vera Cruz was divided between the small ports of Tampico, Tuxpan, and Huasacualco *. It has been calculated that the navigation from Philadelphia to Nootka, and the mouth of the Rio Columbia, which is nearly 5000 marine leagues, taking the ordinary way round Cape Horn, would be

* *Balanza del comercio maritimo de Vera Cruz correspondiente el año de* 1811, p. 19, N° 10.

shortened at least 3000 leagues, if the passage from Huasacualco to Tehuantepec could be effected by a canal. Having had at my disposal, in the archives of the vice-royalty of Mexico, the memoirs of two engineers *, who were appointed to examine the isthmus, I have been able to form a precise idea of the local circumstances. No doubt the ridge which forms the partition of the waters between the two seas is interrupted by a transversal valley, in which a canal of derivation might be dug. It has been recently asserted, that in the time of high floods this valley is filled with a sufficient quantity of water to admit of a natural passage for the boats of the Indians; but I found no indication of this interesting fact in the different official reports addressed to the viceroy, Don Antonio Bucareli. Similar communications exist, at the period of great inundations, between the basins of the rivers St. Lawrence and Mississipi, that is, between the lake Erie and the Wabash, between the lake Michigan and the river of the Illinois †. The canal of Huasacualco, projected during the able administration of the Count de Revillagigedo, would join the Rio Chimalapa and the Rio del Passo, which is a tributary stream of the Huasacualco; it would be only about 16000 toises long, and from the

* Don Augustin Cramer and Don Miguel del Corral.

† See above, Vol. iv, p. 152; Vol. v, 472.

description given of it by the engineer Cramer, who enjoyed a high reputation, it appears that it would require neither sluices, subterranean galleries, nor the use of inclined planes. It must not, however, be forgotten that no barometric or geodesic levelling has been hitherto executed in the territory comprised between the ports of Tehuantepec and San Francisco de Chimalapa; between the sources of the Rio del Passo and los Cerros de los Mixes. By glancing on the map I have sketched of those countries, we may conceive that the difficulty of this enterprise, which the government of Mexico is about to undertake, consists less in tracing the canal, than in the labours necessary to render the Rio Chimalapa navigable for large vessels, as well as the seven rapids of the Rio del Passo, from the ancient *embarcadère*, on the north of the forests of Tarifa, to the mouth of the Rio Saravia, near the new *embarcadère* de la Cruz. It is to be feared, that, on account of the breadth of this isthmus (which is more than 38 leagues), the windings and the beds of the rivers will oppose obstacles to the project of opening a canal of sea navigation appropriated for vessels trading to China, and the north-west coast of America; it would, therefore, be of the highest importance to establish a line of navigation for small craft, or to improve the road by land,

passing by Chihuitan and Petapa. This road was opened in 1798 and 1801, and the indigos of Guatimala, as well as cochineal and salt provisions, have long been conveyed by that route to Vera Cruz and the island of Cuba.

The isthmus of Nicaragua and that of Cupica have always appeared to me the most favourable for the formation of *canals of large dimensions*, similar to the Caledonian canal, which is 103 feet (French measure) broad at the water's edge, exclusive of the raised way which stops the falling in of the earth; 47 feet broad at the bottom, and 18½ deep. In considering a communication between two seas, capable of producing a revolution in the commercial world, we must not limit our attention to such means as only serve to establish a system of inland navigation by small locks, as in the canals of Languedoc, Briare, or in the Grand Junction, and the Forth and Clyde canals. Some of those canals long appeared to be gigantic enterprizes, and indeed they were so when compared with canals of smaller dimensions: but their *mean* depth *, not being more than from 6 to 7½ French feet, they cannot give a passage like

* Andreossi, Description of the canal of Languedoc, p. 138. *Huerne de Pommeuse*, on Navigable Canals, 1822, p. 64, 264, 309. Dupin, Mem. on the Marine, and the Bridges and Highways of France and England, p. 65 and 72. *Dutens*, Mem. on the Public Works of England, p. 295.

the Caledonian canal, admit merchant vessels of heavy tonnage, and thirty-two gun frigates. It is, however, the practicability of this passage which is discussed in the project of cutting an isthmus in America. The pretended *junction of the two seas*, by the canal of Languedoc, has not spared the navigation a circuit of more than 600 leagues round the Spanish Peninsula; and, however admirable this hydraulic work may be which receives annually 1900 flat-boats, carrying from 100 to 120 tons each, it can only be considered as a means of *inland carriage:* since it very little diminishes the number of vessels that pass through the straits of Gibraltar. It cannot be doubted, that if at any given point of equinoctial America, either in the isthmus of Cupica, or in those of Panama, Nicaragua, or even Huasacualco, two neighbouring ports were joined by a *canal of small dimensions*, (of from 4 to 7 feet deep), it would produce great commercial activity. This canal would act like a rail-way, and small as it might be, would enliven and abridge the communications between the western coasts of America and those of the United States and of Europe. If even in time of war, the long and dangerous passage round Cape Horn has been generally preferred for the exportation of the copper of Chili, bark, the wool of the vigogne of Peru, and the cacao of Guayaquil, to the commercial

entrepôt of Panama and Portobello, it is only on account of the want of the means of transport, and the extreme misery that prevails in those towns, which were so flourishing at the beginning of the conquest. The difficulties here mentioned increase in conveying merchandize from Carthagena or the West Indies, to Quito and Lima; and when sent up in the direction from north to south, by the Rio Chagre, the force of its current must be overcome, like that of the winds and currents of the Pacific ocean.

By rendering the Chagre navigable, employing long steam boats, establishing rail-ways, introducing the camels of the Canaries, which, at the time of my visit, had begun to multiply in Venezuela *, by digging small canals in the isthmus of Cupica, or on the neck of land that separates the lake of Nicaragua from the coast of the South Sea, the prosperity of American industry might be increased, but very indirect influence would be exerted on the general interests of civilized nations. The direction of the trade of Europe and the United States with the *fur coast* (between the mouth of the Columbia and Cook river), with the Sandwich Islands, rich in sandal wood, with India and China, would not be changed. Distant communications require ships of great tonnage, that admit

* See above, Vol. i, p. 78, 121; Vol. iv, p. 182—185, and *Political Essay*, Vol. iv, p. 14.

of being heavily laden; natural or artificial passes, of the mean depth of from 15 to 17 feet; and an uninterrupted navigation, requiring no unloading of the vessels. These conditions are indispensable, and it would be changing the question to confound the canals which, by their dimensions, serve only to facilitate inland communications, and a coasting trade, (like the canals of Languedoc and the Clyde, between the Mediterranean and the Atlantic Ocean, or between the Irish and North Seas), with basins and locks capable of receiving the ships employed in the trade of Canton. In a matter that interests every nation which has made some progress in civilization, greater precision should be used than has hitherto been done, respecting a problem, the successful application of which depends principally on the choice of the localities. It would be imprudent, I here repeat, to begin at one point without having examined and levelled others; and it would be above all to be regretted if the works were undertaken on too small a scale; for in works of this description the expence does not augment in proportion to the section of the canals, or the breadth of the water channel.

The erroneous idea which geographers, or rather drawers of maps, have so long propagated of the equal heights of the Cordilleras of America, their prolongation in the form of

walls and continued ridges, and finally, of the absence* of any transversal valley crossing the pretended central chains, has caused it to be generally believed that the junction of the seas is an undertaking of greater difficulty than there has been hitherto reason to suppose. It appears that there are no chains of mountains, not even a ridge of partition, or any sensible line of demarcation† between the bay of Cu-

* I have treated of the source of these errors, Vol. iv, p. 301; Vol. v, p. 41, 456—464, 472, 554.

† This expression surely indicates the facility with which a canal might be traced. A slow ascent of from 40 to 50 toises may, indeed, become at length insensible. I found the great square of Lima 88 toises above the waters of the South Sea, yet, in going from Callao to Lima, this difference of level is scarcely perceived on a distance half as great as that from Cupica to the embarcadador of the Rio Naipi. The geographical position of Cupica is quite as uncertain as the position of the confluence of the Naipi with the Atrato; and this uncertainty appears less strange when we recollect that it extends over the whole southern coast of the isthmus of Panama, and that no mariners, furnished with exact instruments, ever run along the shore in sight of land, between the Capes of Charambira and San Francisco Solano. Cupica is a port of the province of Biruquete, which is but little known, and which the maps of the *Deposito de hydrografico* of Madrid place between Darien and the Choco de Norte. It took its name from that of a Cacique called *Birú* or Biruquete, who reigned over lands in the neighbourhood of the gulf of San Miguel, and who fought, in 1515, as an ally of the Spaniards (*Herera*, *Dec.*, Vol. ii, p. 8). I have not seen the port of Cupica marked in any Spanish map, but have found

pica, on the coast of the South Sea, and the Rio Naipa, which empties itself into the Atrato, fifteen leagues above its mouth. A biscayan pilot, M. Goguenechе, called the attention of government to this point in the year 1799. Persons worthy of credit, who had made the passage with him from the Pacific Sea to the Embarcadere of Naipi, assured me that they saw no hill in that isthmus of alluvial earth, which they were ten hours in crossing. A merchant of Carthagena, South America, deeply interested in all that regards the statistics of New Grenada, Don Ignacio Pombo *, wrote to me in the month of February 1803:—"Since you ascended the Rio Magdalena to Santa-Fe, and Quito, I have never ceased to take informations respecting the isthmus of Cupica; there are

Puerto Quemado ò Tupica, at 7° 15′ lat. (*Carta del Mar de las Antillas*, 1805. *Carta de la costa occidental de la America*, 1810.) A manuscript sketch in my possession of the province of Choco, confounds Cupica and Rio Sabaleta, lat. 6° 30′; yet, Rio Sabaleta is placed in the maps of the *Deposito*, south, and not north of Cape San Francisco Salano, consequently, 45′ south of Puerto Quemado. According to the map of the province of Carthagena, by Don Vicenti, London, 1816, the confluence of the Rio Napipi (Naipi?) is 6° 40′ lat. It is to be hoped that these uncertainties of position will soon be removed by observations taken on the spot.

* Friend of the celebrated Mutis, and author of a little work on the trade of quinquina (*Noticias varias sobre las quinas oficinales, Carth. de Indias*, 1817), which I have several times had occasion to quote.

only from 5 to 6 leagues from that port to the Embarcadere of Rio Naipi, and the whole territory is a plain (*tereno enteramiente Llanos*)." From the facts I have mentioned it cannot be doubted that this part of the northern Choco is of the highest importance for solving the problem under our consideration; but, in order to form a precise idea of this absence of mountains at the southern extremity of the isthmus of Panama, we must bear in mind the general outline of the Cordilleras. The chain of the Andes is divided at the 2° and 5° of latitude into three chains*, and the two longitudinal vallies that separate those chains form the basins of the Magdalena and the Rio Cauca. The eastern branch of the Cordilleras inclines towards the north-east, and joins itself by the mountains of Pamplune and Grita, to the *Sierra Nevada de Merida*, and the chain of the coast of Vene-

* Eastern Chain, that of Suma Paz, Chingasa, and Guachaneque, between Neiva and the basin of Guaviare, and Santa-Fe de Bogota and the basin of Meta; intermediary chain, that of Guanacas, Quindio, and Erve (Herveo), between the Rio Magdalena and the Rio Cauca, the la Plata and Popayan, and between Ibaguè and Carthago; western chain, between the Rio Cauca and the Rio San Juan, the Cali and Novita, and between Carthago and Tadò. (See my Geogr. Atlas, pl. 24.) This last chain, which separates the provinces of Popayan and Choco, is generally very low; it is, however, said to rise considerably in the mountain of Torà, at the west of Calima. (*Pombò, de las Quinas*, p. 67.)

zuela, and the intermediate and western branches of Quindio and Choco, run into one another in the province of Antioquia, between the 5° and 7° of latitude, and form a groupe of mountains of considerable breadth, stretching by the *Valle de Osos* and the *Alto del Viento*, towards Cazeres, and the elevated savannahs of Tolu. Further west, in the *Choco del Norte*, the mountains lower to such a degree, that, between the gulf of Cupica and the Rio Naipi, they disappear altogether. It is the astronomical position of that isthmus and the distance from the mouth of the Atrato to its confluence with the Rio Naipi * that should be fixed with

* The geography of that part of America, between the mouth of the Atrato, the Cape Corientes, the Cerro de Tora, and Vega de Supia, is in a most deplorable state. It is only more to the east, in the province of Antioquia, that the labours of Don Jose Manuel Restrepo present some points of which the position is astronomically fixed. From Cupica to Cape Corientes, the distance by land is computed to be from 12 to 14 (?) marine leagues. From Quibdo (Zitara), where resides the *Teniente Gobernador*, (the corregidor inhabits Novita,) it takes from 7 to 8 days of navigation to go down as far as the mouth of the Atrato. An error, common to every common map (excepting that of M. Talledo), is placing Zitara 1° too much to the north, sometimes at the mouth of the Atrato, sometimes at its confluence with the Naipi. From San Pablo, situated some leagues above Tado, on the right bank of the Rio San Juan, to Quibdo or Zitara, is only one day's journey.

precision; we do not know whether sloops can ascend to this point.

After the lake of Nicaragua, Cupica, and Huasacualco, the isthmus of Panama merits the most serious attention. The practicability of forming a canal for ship navigation depends, at the same time, on the height of the point of partition, and the configuration of the coasts; that is, on the *maximum* of their nearness to each other. So narrow a neck of land might, by its direction, have escaped the destructive influence of the current of rotation; and the supposition that the greatest height of the mountains must correspond to the *minimum* of the distance between the coasts, would not, in our days, be justified even by the principles of merely systematic geology. Since I published my first work on the junction of the seas, we remain, unfortunately, in the same ignorance respecting the height of the ridge which the canal must pass over. Two learned travellers, MM. Boussingault and Rivero, levelled the Cordilleras from Caraccas to Pamplona, and from thence to Santa-Fe de Bogota, with a precision superior to any thing I could attempt in that kind of research; but on the north-west of Bogota, from the Andes of Quindiu and Antioquia, levelled by M. Restrepo and myself, as far as the table land of Mexico, in the 12° of latitude of *central America*, not one single mea-

sure of height has been made since my return to Europe. It is much to be regretted that, towards the middle of the last century, the French academicians crossed the isthmus of Panama without thinking of opening their barometer at the point of the partition of the waters. Some observations which Ulloa has repeated, as by chance, have led me to conclude that from the mouth of the Rio Chagre to the embarcadere of Cruces, there is a difference of level of 210, or 240 feet *. From the Venta de Cruces to Panama you ascend rapidly, and then descend during several hours towards the South Sea. It is, therefore, between this port and Cruces that the threshold, or point of partition, is placed, which the canal must pass over, if the idea be persisted in of giving it that direction. I shall here mention that it would suffice, in order to enjoy the view of the two oceans at once, that the mountains of the *line of elevation* in the isthmus were 580 feet high, that is, only a third higher than the Naurouse, in the chain of the Corbières, which is the point of partition of the canal of Languedoc. Now this simulta-

* Near Chepo and the village of Penomène for instance (*MSS. of the Curate Don Juan Pablo Robles*). The mountains seem to rise towards the province of Veragua, where even wheat is cultivated in the district of Chiriqui del Guami, near the village of la Palma, Franciscan mission, dependent on the college of the Propaganda de Panama.

neous view of the two seas is remarked in some parts of the isthmus as being very extraordinary; from which we may, I think, conclude that the mountains are, in general, not an hundred toises high. Some feeble indications of the temperature and geography of the native plants, lead me to think that the ridge over which the road passes from Cruces to Panama, is not 500 feet high; Mr. Robinson * supposes it at most 400 feet. According to the assertion of a traveller †, who describes with the most ingenuous simplicity what he has seen, the hills that compose the central chain of the isthmus, are separated from each other by vallies, "which leave a free course to the passage of the waters." The researches of the engineers who are charged to explore those countries should be principally directed to the discovery of the transversal vallies. We find examples in every country of natural openings across the ridges. The mountains between the channels of the Saone and the Loire, which the canal of the Centre would have had to pass over, were eight or nine hundred feet high; but a neck of land or interruption of the chain near the reservoir of Long Pendu, furnished a passage 350 feet lower.

If we are not at all advanced in the know-

* *Memoir on the Mexican Revolution*, p. 209.

† *Lionel Wafer, Description of the Isthmus of America*, 1729, p. 297.

ledge of the heights of the isthmus of Panama, the last labours of M. Fidalgo, and other Spanish navigators, have at least furnished more precise statements on its configuration, and the *minimum* of its breadth. This *minimum* is not 15 miles, as the first maps of the *Deposito hydrografico* indicate, but 25¼ miles (60 to a degree), that is, 8¾ marine leagues, or 24,500 toises; for the dimensions of the gulf of San Blas, called also Ensenada de Mandinga, on account of the small river of that name which flows into it, have given rise to great errors. This gulf penetrates into the land 17 miles less than was supposed in 1805, in taking the plan of the archipelago of the *Islas Mulatas**. Whatever credit the last astronomical observations appear to merit, and on which the map of the isthmus is founded, published by the Royal Deposit of the Marine of Madrid in 1817, we must not forget that these operations comprehend only the northern coast, which appears never yet to have been connected either by a chain of triangles, or chronometrically (by the transport of time), with the southern coast.

* See my Political Essay, Vol. iv, p. 348. In comparing the two maps *Deposito hydrografico de Madrid*, bearing the title *Carta eserica del Mar de Antillas y de las Costas de Tierra Firme desde la isla de la Trinidad hasta el golfo de Honduras*, 1806, and the *Quarto Hoja que comprehende la provincia de Cartagena*, 1819, we see how well founded were the doubts

Now, the problem of the breadth of the isthmus does not solely depend on the determination of the latitude. The government of Columbia hav-

I announced fifteen years ago, on the relative position of the most important points of the southern and northern coasts of the isthmus. Panama was anciently believed (*Don Jorge Juan.* Travels in South America, Vol. i, p. 99), to be 31′ to the *west* of Portobello. La Cruz (1775), and Lopez (1785) have followed this supposition, founded only on a plan of the direction of the route, taken with a compass. But in 1802, Lopez (*Mapa del Reyno de Tierra Firme y sus provincias de Veragua y Darien*) began to place Panama 17′ to the *east* of Portobello. In the map of the *Deposito* of 1805, this difference of meridians was reduced to 7′; finally, the map of the *Deposito* of 1817 places Panama 25′ east of Portobello. The following are other differences of latitude on which the breadth of the isthmus depends :—

	Map of 1809.	Map of 1817.
Southern coast between the mouths of the Rio Juan Diaz and the Rio Jucume on the east of Panama, in the meridian of Punta San Blas	8° 54′	9° 2½′
Northern coast forming the bottom of the gulf Mandinga, or of San Blas, on the south of the Islas Mulatas	9° 9′	9° 27½′
From this difference of latitudes the results are, for the *minimum* of the breadth of the isthmus, nearly 14,250 toises, according to the map of 1805, and nearly 24,463 toises, according to the map of 1817.		
Punta San Blas, N.W. part of the gulf of Mandinga	9° 33′	9° 34½′

ing lately received excellent barometers, constructed by M. Fortin, may direct the geodesic levellings, which are always slow and expensive, to be preceded by barometric levellings, which in the torrid zone are extremely exact. I am assured that in those countries correspondent observations may be dispensed with, on account of the marvellous regularity of the horary variations, without fearing errors of 4 or 5 toises.

The points which ought to be carefully examined are the following:—the *Isthmus of Huasacualco*, between the sources of the Rio Chimalapa and the Rio del Passo; the *Isthmus of Nicaragua* *, between the lake of that name, and the

This cape not having been carried to the north in the same measure as the bottom of the gulf, near the mouth of the Rio Mandinga, it thence results, that, according to the first map, the gulf enters 24′, and according to the second, 7′. It is probable that the changes of latitude which result from the last expedition of M. Fidalgo, must be attributed to the want of *artificial horizons*, and to the difficulty of observing the sun with instruments of reflexion, amidst a group of islands, and above a sea where the horizon is not clear. More to the west the mean breadth of the isthmus, between Castillo de Chagres, Panama, and Portobello, is 14 marine leagues; the *minimum* of its breadth (8 leagues) is two or three times less than the breadth of the isthmus of Suez, which M. Le Pere finds to be 59,000 toises.

* If the question here agitated related only to *canals of small navigation*, fit solely to enliven inland trade, I should also have named the coast of Verapaz and Honduras. The

insulated volcanoes of Granada and Bombacho; the *Isthmus of Panama*, between the Venta de Cruces, or rather between the Indian village of Gorgona, 3 leagues below Cruces, and the port of Panama, between the Rio Trinidad and the Rio Caymito; the bay of Mandinga and the Rio Juan Diaz; the Ensenada de Anachacuna (west of the Cape Tiburon) and the gulf of San Miguel, in which the Rio Chuchunque, or Tuyra loses itself; the *Isthmus of Cupica*, between the coast of the South Sea and the confluence of the Rio Naipi with the Rio Atrato; and finally, the *Isthmus of Choco*, between the Rio Quibdo, upper tributary stream of the

Golfo Dulce in the meridian of Sonfonate, runs more than 20 leagues into the land, so that the distance of the village of Zacapa (in the province of Chiquimala, near the southern extremity of the *Golfo Dulce*) is only 21 leagues from the coast of the Pacific Ocean. The rivers of the north approach the waters which the Cordilleras of Izalco and Sacatepeques empty into the South Sea. We find on the east of *Golfo Dulce*, in the *partido* of Comayagua, the Rio Grande of Motagua, or Rio de las *bodegas* de Gualan, the Rio le Camalecon, the Ulua, and the Lean, which are navigable for large boats, 30 or 40 leagues inland. It is very probable that the Cordillera, which here forms the ridge of partition between the two seas, is divided by some transversal vallies. M. Juarros, in the interesting work he has published at Guatimala, shews us that the fine valley of Chimaltenango pours its waters at the same time on the southern and northern coasts. Steamboats will one day give activity to the trade on the rivers of Motagua and Polochic.

Atrato, and the Rio San Juan, de Charambira. Persons accustomed to take accurate observations, if furnished only with barometers, instruments of reflection, and time-keepers, might in a few months solve problems, which, during centuries, have interested all the commercial nations of both worlds. If, in the enumeration of the countries which present advantages for the junction of the two seas, I have not passed over in silence the Isthmus of Choco, that is the *platiniferous* soil, extending from the river San Juan de Charambira to the Rio Quibdo, it is on account of its being the sole point on which a communication exists since the year 1788, between the Atlantic Ocean and the South Sea. The small canal of Raspadura, which a monk, the curate of Novita, caused to be dug by the Indians of his parish, in a ravine periodically filled by natural inundations, facilitates the inland navigation on a length of 75 leagues, between the mouth of the Rio San Juan, below Noanama, and that of the Atrato, which bears also the names of Rio Grande del Darien, Rio Dabeiba, and Rio del Choco *. During the

* I might have added the synonymous name of San Juan (del Norte), if I did not fear confounding the Atrato with the Rio San Juan of Nicaragua, and the Rio San Juan of Charambira. The name Dabeiba is that of a female warrior, who reigned, according to the first historians of the conquest, in the mountainous countries between the Atrato and

wars which preceded the revolution of Spanish America, considerable quantities of cacao of Guayaquil were conveyed this way to Carthagena. The canal of Raspadura, of which I believe I gave the first intimation in Europe, affords a passage only for small boats; but it might be easily enlarged * if the streams were joined to it known by the names of Cano de las

the source of the Rio Sinu (Zenu) on the north of the town of Antioquia. According to the work of Petrus Martyr d'Anghiera (*Oceanica*, p. 52), this woman was confounded in a local mythology with a divinity of the lofty mountains, whence dart the lightnings. We recognize, in our days, the name of Dabieba, in that of the hills Abibi or Avidi, given to the Altos del Viento, in latitude 7° 15′ west of the Boca del Espiritu Santa, on the banks of the Cauca. Where is the volcano of Ebojito, which La Cruz and Lopez place in the almost desert countries between the Rio San Jorge, a tributary stream of the Cauca, and the source of the Rio Murry, a tributary stream of the Atrato? The existence of this volcano appears to me very doubtful.

* *Relacion del estado del Nuevo Reyno de Grenada que hace el Arzobispo Obispo de Cordova a su sucesor el Exc. Sr. Fray Don Francisco Gil. y Lemos* 1789, fol. 68. (A manuscript written by the Secretary of the Archbishop-Viceroy, Don Ignacio Cavero.) *Representacion que dirigio Don Jose Ignacio Pombo al Consulado de Cartagena en* 14 *de Mayo* 1807, *sobre el reconocimiento del Atratoes Zinù y San Juan*, fol. 38 (MS.) The ravine of Raspadura, or Bocachica, now receives only the waters of Quebradas de Quiadocito, Platanita, and of Quiadó. According to the ideas I acquired at Honda and Vilela, near Cali, from persons in the trade of (*rescate*) the gold dust of Choco, the Rio Quibdo, which communicates

Animas, Cano del Calichi, and Aguas claras. *Feeding trenches* are easily established in a country like Choco, where it rains during the whole year, and where thunder is every day heard. The barometric observations of the unfortunate Caldas not having been published, we

with the canal of the Mina de Raspadura, joins the Rio Zitura and the Rio Andageda, near the village of Quibdo, vulgarly called Zitura; but in a manuscript map which I have just received from Choco, and on which the canal of Raspadura (lat. 5° 20′?) joins both the Rio San Juan and the Rio Quibdo, a little above the Mina de las Animas, the village of Quibdo is placed at the confluence of the small river of that name, with the river Atrato, which has received three leagues higher the Rio Andagueda, near Lloro. The grand Rio San Juan receives successively from its mouth (lat. 4° 6′) at the south of the Punta de Charambira, in going up towards the N.N.E., the Rio Calima, the Rio del Nò (above the village of Naonama), the Rio Tamana, which passes near the Novita, the Rio Irò, the Quebrada de San Pablo, and finally, near the village of Tadò, the Rio de la Platina. The province of Choco is inhabited only in the vallies of those rivers: it has three trading communications; in the north with Carthagena by the Atrato, the banks of which are entirely desert from 6° 45′ of latitude; in the south with Guayaquil, and, before 1786, with Valparaiso, by the Rio San Juan; in the east with the province of Popayan, by the Tambo de Calima, and by Cali. From Tadò to Noanama, in going down the Rio San Juan, takes one day; to the Tambo de Calima (lat. 4° 12′) 4 days; and from the Tambo to Cali (lat. 3° 25′), in the valley of Cauca, 5 days; during which you cross the Rio Dagua, or San Buenaventura, and the western Cordillera of the Andes of Popayan. I have entered into these local de-

are ignorant of the height of the point of partition between San Pablo and the Rio Quibdo. We only know that there are some *gold-washings* in those countries, at the height of from 360 to 400 toises above the level of the ocean, and that they are never found at a lower elevation than 50 toises. The position of the canal, in the interior of the continent, its great distance from the coast, and the frequent falls *(raudalitos y choreras)* of the rivers, which it is necessary to ascend and descend, in order to pass from one sea to another, from the port of Charambira to the gulf of Darien, are obstacles too difficult to be overcome, in order to establish *a line of great navigation* across the Choco. But that line, even without furnishing a passage for vessels of great tonnage, will not be less worthy of the attention of a wise administration; it will give life to inland trade

tails, because the maps confound the ravine of Raspadura, which serves as a canal, with the *portages* of Calima and San Pablo. The *arastradero* of San Pablo leads also to the Rio Quibdo, but several leagues above the mouth of the canal of Raspadura. The road of the *arastradero* of San Pablo is usually taken for the conveyance of merchandize (*generos*) sent from Popayan, by Cali, Tambo de Calima, and Novita, to *Choco del Norte*, that is, to Quibdo (Zitara). The geographer La Cruz, calls the whole isthmus between the sources of the Rio Atrato and the Rio San Juan, *Arastradero del Toro*. (On the height of the *Zone of Gold*, *Semanario de Santa Fe*, Vol. i, p. 19.)

between Carthagena and the province of Quito, and between the port of Santa Marta and Peru. We shall observe, at the close of this discussion, that the ministry of Madrid never enjoined the viceroy of Santa-Fe to fill up the ravine of Raspadura, or to punish with death those who attempted to re-establish a canal at Choco, as has been asserted in a work recently published. This supicious policy may indeed remind us of the order given to the Viceroy of New Spain during my stay in America, to root up the stocks of the vines in the *provincias internas*; but the hatred borne towards the culture of the vine in the colonies was owing to the influence of some merchants of Cadiz, who were jealous of what they called their ancient monopoly, while a small ravine that crosses the forests of Choco, escaped more easily the vigilance of the ministry, and the jealousy of the mother country *.

After having examined the localities of the different points of partition, according to the imperfect information which I have hitherto been able to collect, it remains to prove, by the analogy of what men have executed in the state of modern civilization, the possibility of realizing the junction of the two oceans. In proportion as problems become complicated, and de-

* *Robinson*, Vol. ii, p. 266.

pend on a great number of elements by their nature variable, is the difficulty of fixing the *maximum* which the efforts of intelligence and the physical power of nations are capable of exerting. During the thousands of years that have elapsed from the unknown period of the construction of the pyramids of Ghizeh, to that of our gothic steeples and the cupola of Saint Peter's, men have not raised one edifice exceeding 450 feet in height *; but shall we presume to conclude from this fact, that modern architecture cannot go beyond an elevation scarcely equal to forty times that of the edifices constructed by white ants? If the question here agitated respected only canals of a mean size, having a depth of only from 3 to 6 feet, and serving merely for inland navigation, I could mention canals long since executed, which pass over ridges of mountains of from 300 to 580 feet high †. England alone, of which the canals

* Ancient French measure, *pied de Roi*, or 75 toises.

† The following are the partial statements for ten canals, arranged according to the order of the height of their points of partition :—

NAMES OF THE CANALS.	*Elevation of the Points of Partition in French feet.*
Canal of Languedoc, or of the South. (Length, 123,730 toises; mean depth, 6 f. 2 in.); number of locks, 100; expence of construction, in the time of Louis the 14th, nearly 16,280,000 francs; at the present value of money 38 millions of francs. G. N.	582

are 584 marine leagues in length, contains nineteen that cross the points of partition between

NAMES OF THE CANALS.	*Elevation of the Points of Partition in French feet.*
Leominster Canal. (Length, 37,745 toises; expence, 14 millions of francs). L. N.	465
Huddersfield Canal. (Length, 15,900 toises; expence 6½ millions of francs). L. N.	409
Leeds and Liverpool Canal. (Length, 106,700 toises; number of locks, 91; expence 14,400,000 francs). G. N.	404
Canal du Centre, between the Saone and the Loire. (Length, 58,300 toises; depth, 5 feet; number of locks, 80; expence, 11 millions of francs). G. N.	403
The Grand Trunk Canal, or that of the Trent and Mersey. (Length, 272,000 toises; depth, from 4 to 5 feet; number of locks, 75; expence, 9½ millions of francs). G. N.	382
Grand Junction Canal. (Length, 74,400 toises; depth, 4 f. 3 in.; number of locks, 101; expence, 48 millions of francs). G. N.	370
Canal de Briare, constructed in 1642, the most ancient of the canals, at the point of partition. (Length, 14,500 toises; depth, 4 feet; number of locks, 40; expence, 10 millions of francs). G. N.	243
Forth and Clyde Canal. (Length, 34,000 toises; depth, 7½ feet; number of locks, 39; expence, 10 millions of francs).	155
Caledonian Canal. (Length, 18,500 toises; number of locks, 23; depth, 18 f. 9 in.; expence, 19 millions of francs). G. N.	88

The initials of the words *Great and Little Navigation* have been added, to distinguish the canals, which, according to the

the rivers of the western and the eastern coast. Engineers have long so little regarded 580 feet, that is, the height of the *bief* of division of Naurouse, on the canal of the south, as the *maximum* which may be reasonably attained in this kind of hydraulic construction, that Mr. Perronet, a man justly celebrated, considers the project as very practicable, of forming a canal in Burgundy, between the Yonne and the Saone, which must pass over a height (near Pouilly), of 921 feet above the level of the Yonne at low water. In combining inclined planes and railways with lines of navigation, boats have passed into the Monmouthshire canal at a thousand feet of elevation; but such works, so important for the prosperity of the inland trade of a country, do not constitute what may be called *canals for sea navigation.*

The discussion with which we are at present occupied, regards the communication from sea to sea by vessels fitted, from their structure and tonnage, for the India and Chinese trade. Now, the industry of the nations of Europe presents two examples of these oceanic communications, on a very great scale; one, in the canal of the Eyder or Holstein, the other in the Caledonian

English usage, are thus classified. (*Dutens, Mem. sur les travaux publics*, p. 81, 91, 94.) The locks of the first class are at least 64 feet long, and 14 feet wide; the locks of the second class are also 64 feet long, but only 7 feet wide.

canal. The former of those works, constructed from 1777 to 1784, joins the Baltic with the North Sea, between Kiel and Tonningen; having only six locks, and passing over a bar of 28 feet. It separates the continental part of Denmark from Germany, and enables vessels of an ordinary size to avoid the dangerous passage of the Cattegat and the Sound. It receives ships of from 140 to 160 tons *, coming from the ports of Russia and Prussia, and going to England, the Mediterranean, Philadelphia, the Havannah, and the western coast of Africa. These vessels draw only from 8 to 10 feet of water †. Being generally constructed in Holland or in the Baltic, the ribs are very flat, and they are consequently spacious without drawing much water. The Caledonian canal, not the most useful, but unquestionably the most magnificent hydraulic work hitherto undertaken, is an *oceanic canal* in the strictest sense of the terms. It unites the eastern and western seas of Scotland, between Inverness and Fort William, in a neck of land across which nature

* From 75 to 90 *Last*. The size of the flat bottomed boats that sail on the canals of great navigation in England, is generally but from 40 to 50 tons. On the canal of Languedoc, the largest boats are of 120 tons.

† The feet are always the ancient measure of France, in *pieds de roi*, of which 6 make 1m,949, when the contrary is not expressly indicated.

seems to have traced the line of junction. The navigable part is 17 leagues in length (20 to a degree), of which there are only 6½ of artificial excavation; the remainder forms a natural navigation on the lakes of Oich and Lochy, separated heretofore by a rocky ridge. This canal was completed in the space of 16 years, admits the passage of frigates of 32 guns, and of large ships employed in foreign trade. Its mean depth is 18 feet 8 inches (6^{m},09), and its breadth at the bottom, 47 feet (15^{m},2). The locks, 23 in number, are 150 feet long, and 37 feet wide.

Being guided in the practical views presented at the end of this chapter, only by the analogy of the labours already performed by man, I shall first observe, that the breadth of the isthmuses of Cupica and Nicaragua, in which the height of the ridge of partition is very inconsiderable, is nearly the same as the breadth of the land crossed by the artificial part of the Caledonian canal. The isthmus of Nicaragua, by the position of its inland lake, and the communication of that lake with the Atlantic, by the Rio San Juan, presents several features of resemblance with that neck of land in the Scotch Highlands where the river Ness forms a natural communication between the mountain lakes and the gulf of Murray. At Nicaragua, as in the Scotch Highlands, there would be but one

narrow ridge to pass over; for, if the Rio San Juan in a great part of its course is from 30 to 40 feet deep, as is asserted, it would only require to be rendered navigable in some parts by means of wears or lateral channels*.

With respect to the depth of the oceanic

* This point, near the openings of the wood of Campeche, (*Cortes de Madera*) had attracted the attention of the commercial world long before the publication of the excellent work on Jamaica, by Mr. Bryan Edwards. See *La Bastide, Mem. sur le passage de la mer du Sud à la Mer du Nord*, p. 7. There is a triple possibility of forming the canal of Nicaragua (as I have already stated in the *Political Essay*) either from the lake of Nicaragua to the gulf of Papagayo, or from that lake to the gulf of Nicoya, or from the lake de Leon, or Managua, to the mouth of the Rio de Tosta (and not from the lake de Leon to the gulf of Nicoya, as is asserted by the usually well-informed editor of the *Biblioteca Americana*, 1823, *Agosto*, p. 120.) Does there exist a river that flows from the lake of Leon to the Pacific Ocean? Of this I doubt, although ancient maps mark the communications between the lakes and the sea (*Political Essay*, Vol. i, p. 25). The distance from the south-east extremity of the lake of Nicaragua to the gulf of Nicoya, is very differently indicated (from 25 to 48 miles) in Arrowsmith's map of South America, and in the fine map of the depot of Madrid, bearing the title of *Mar de las Antillas*, 1819. The breadth of the isthmus between the eastern shore of the lake of Nicaragua, and the gulf of Popagayo is from 4 to 5 marine leagues. The Rio San Juan has three mouths, of which the two smallest are called *Taure* and *Caño Colorado*. In one of the isles of the lake of Nicaragua, that of Ometep, there is a volcano, said to be still burning.

canal projected in central America, it might, I think, be even less than the depth of the Caledonian canal. Such is the change which the new systems of commerce and navigation have produced within 15 years, in the capacity or the structure of the ships most commonly employed in the intercourse with India and China, that in examining with attention the official list of vessels, which during two years (from July 1821 to June 1823), have traded from London and Liverpool to those two countries, we find, on a total of 216 vessels, *two-thirds* below 600 tons, one-fourth between 900 and 1400 tons, and one-seventh below 400 tons *. In France, the *mean tonnage* in the ports of Bordeaux, Nantes, and Havre, of vessels trading to India, is 350 tons. The nature of the operations undertaken in the most distant latitudes, determines the capacity of the vessels employed; for instance, to bring indigo from Bengal, it may appear sufficient, and even preferable, to send a vessel of 150 to 200 tons. The system of small expeditions is preferably adopted in America, where all the advantages are felt of prompt lading, and a rapid circulation of capital. The average size of the American vessels

* *East India Shipping—return to the order of the House of Commons, London*, 1823. I have reduced the English into French tonnage, the latter being 10 p. c. less.

that go to India round the Cape of Good Hope, and to Peru round Cape Horn, is 400 tons; the whale-boats of the South Sea are only 200 or 300 tons. In Spanish America, from ancient custom, ships of much greater tonnage are employed in time of peace. At Vera Cruz for example, where there entered, during my stay in Mexico, from 100 to 130 vessels coming from Spain, their size was generally 500 tons. It is only in time of war that shipments of 300 tons are made for Cadiz.

These statements sufficiently prove, that in the present commercial state of the world, such a canal of junction as is projected between the Atlantic Ocean and the South Sea, would be sufficiently large, if by its section and the capacity of its locks, it could admit the passage of vessels of from 300 to 400 tons burden. This ought to be the *minimum* of its dimensions, and it supposes, after what we have indicated above, a capacity nearly double that of the canal of Holstein, but much less than that of the Caledonian canal; the former receiving vessels of from 150 to 180 tons, and the latter, frigates of 32 guns, and merchant ships of more than 500 tons. It is true that the tonnage determines only by approximation the quantity of water a ship draws, since the excellence or defects of its construction alters at the same time its

speed, and its capacity for stowage. We may, however, admit * that a mean depth of from 15½ to 17½ feet will suffice for a canal of junction intended for vessels of 300 to 400 tons; this is fifteen inches less than the celebrated engineers, Messrs. Rennie, Jessop, and Telford, have given to the Caledonian canal, and double that of the canal of the Forth and Clyde.

The gigantic works of Europe which we have mentioned as examples, and the construction of which has not cost more than 4 millions of piastres, have had very small heights to pass over, less than from 90 to 100 feet. The canals which cross the ridges of partition of from three

* I suppose that a foot and a half of water may suffice under the keel of a vessel that navigates in a canal of which the waters are perfectly calm, and which is carefully cleaned. Notwithstanding the great difference of construction, which has an equal influence on the quantity of water a ship draws, we may, by approximation, admit the following statements:

Burden.	*Draught of the Vessel.*
1200—1300 tons.....	19—20 feet.
600— 700.....	17—18
300— 400	14—16
200— 300	11—12

In a matter which interests every man capable of reflecting on the future destinies of nations, and the progress of general civilization, I thought it was proper to give all the statements on which the practical solution of the problem depends. The canal of Crinan, in Scotland, is also from 11 to 14 feet deep, on 3 leagues of length.

to six thousand feet, have been hitherto only from 4 to 6 feet deep. The difficulties naturally increase with the elevation of the ridge of partition, the depth of the excavations, and the size, if not the multiplicity, of the locks. It is not enough to dig the canal; it must be ascertained that the quantity of water derived from the upper ground is equal to the demand for filling it; that is, sufficient to feed the canal, and to replace what is lost by the locks, by evaporation, and by filtration. We have seen above that the local circumstances in the isthmuses of Cupica and Huasacualco are such, that the obstacle to be overcome in effecting the junction of the seas, is less the height of the ridge which the canal must cross, than the state of the beds of the rivers (Naipi and Rio del Passo) which must be rendered navigable, either by being excavated by machines worked by a steam-engine, or by wears and lateral derivations. In the intendance of Nicaragua, the great depth of the Rio San Juan, and that of the lake of Nicaragua, or *laguna de Granada*, which is, according to Mr. Robinson, from 17 to 40; and, according to Mr. Juarros, from 20 to 55 feet, seems to render such labors superfluous*. The mountains of the isthmus of Panama rise probably to the elevation of the basins of partition

* *Compendio de la Hist. de Guatimala*, T. i, p. 51. This work is 12 years anterior to that of Mr. Robinson.

of the *Canal du Centre*, (between Châlons and Digoin), and of the Grand Junction canal, (between Brentford and Braunston): the mountains of the isthmus may be still more elevated, and perhaps are divided by no transversal valley from south to north. We think that more advantageous spots may be chosen; but we ought here to observe that the height of the ridge is an inseparable obstacle to the junction of seas, only, when there is not at the same time a sufficient quantity of upper waters fit to be conveyed to the point of partition. Seven or eight locks crowded together on the canals of Briare and Languedoc *, and regulating falls of water of from 64 to 70 feet, long appeared an extraordinary work, notwithstanding the small dimension of the locks, and the depth of the canals, of which the section does not exceed 5 to 6 feet. The *Staircase of Neptune*, in the Caledonian canal, presents a similar accumulation of locks, on a scale so much more extensive, that frigates can rise in a small space of time to the height of 60 feet. Now, that work only cost 257,000 piastres, that is five times less than three pits of the mine of Valenciana in Mexico; and ten *Staircases of Neptune* would cause ships of 600 tons to pass over a ridge of partition 600 feet higher than the chain of the Corbières, between the Mediterranean and the

* Near Rogny and Fonseranne.

Atlantic. I discuss here the possibility only of executing works to which there will certainly be no need to have recourse.

The expence of water for feeding a canal increases, with the extent of the filtrations, the frequency of passages, or of the lockages (*exclusée* *) and with the size of the chambers of locks, but not with their number. The facility of collecting an enormous mass of rain waters within the tropics, is beyond what the engineers of Europe can imagine. When Lewis the 14th ordered the gardens of Versailles to be embellished, Colbert was made to hope that the rains would furnish, on a surface of 12,700 hectares of plains which communicated with ponds and reservoirs, 9 millions of cubic toises of water †. Now the rains in the vicinity of Paris amount annually only to from 19 to 20 inches, while within the torrid zone in the New World, above all, in the region of the forests, the quantity is at least from 100 to 112 inches ‡. This im-

* The *exclusée* is the successive filling of the lock to enable the boats to ascend or descend in a canal, at the point of partition.

† Only $\frac{1}{150}$ could be collected; the remainder was lost by filtrations, and it became necessary to construct the machine of Marly: *Huene de Pommeuse, sur les canaux navigables. Supplément*, p. 45.

‡ See above, Vol. ii, p. 248, 344, 743. The mean quantity of rain that falls annually at Kendal, on the western side of England, is 57 inches; at Bombay 72 and 106

mense difference shews that by the junction of the springs, by feeding-trenches, and well-established reservoirs, an able engineer might avail himself in central America, of circumstances which are wholly dependent upon the

inches; at St. Domingo 113 inches. (*Arago Annuaire du Bur. des Long.*, 1824, p. 165.) M. Antonio-Bernardino Pereira Lago, colonel of infantry of the corps of engineers, at Brazil, thinks he found, in the year 1821 only, at San Luis do Maranhao, (lat. 2° 29′ south), 23 feet 4 inches, 9·7 lines, English measure, which make near 260 French inches. We might be inclined to doubt this prodigious quantity of rain; yet I am in possession of the barometric, thermometric, and ombrometric observations which M. Pereira Lago affirms were made by him, *day by day at those different periods*. These Brazilian observations are published in the *Annaes das Sciencias das Artes et das Letras*, p. 54—79; and the observer who describes the instruments he employed, says expressly, in the *resumo das observacoes meteorologicas*, that the plane on which the rain fell was exactly of the same diameter as the cylinder which contained the scale; this diameter was only 6 inches (English). I wish this important observation may be verified at Maranhao, and repeated in other parts of the tropics, where the rains are abundant; for instance, at Rio Negro, Chocó, and the Isthmus of Panama. The quantity indicated by M. Pereira Lago, is $2\frac{1}{3}$ times greater than what has been observed at the mean term, at the Isle of St. Domingo; but the quantity of water that falls on the western coast of England also exceeds three times that which is collected annually at Paris. There exists very considerable differences in latitudes, that are near each other. Captain Roussin relates that 151 inches of rain-water fell at Cayenne, in the month of February only.

climate. Notwithstanding the high temperature of the air, the loss caused by evaporation * will scarcely counterbalance, in deep basins, the advantages of the tropical rains. The experiments made at the Pontinspar marshes, by M. de Prony, and at the canal of Languedoc †, by MM. Pin and Clausade, indicate, in the latitudes 41° and 43½°, a produce of annual evaporation of 348 lines. The experiments which I made in the tropics, are not sufficiently numerous to draw a general result; but in supposing the atmosphere equally calm in the south of France, and the torrid zone, the mean heat of the year to be 15° and 27° cent., and the mean humidity expressed by the degrees of the hair-hygrometer, 82° and 86° I find, with M. Gay-Lussac, that the evaporation of the two zones is in the relation of 1 to 1·6, while the quantity of rain-water which the earth receives, serves as 1 to 5. We must not either forget that canals lose by evaporation only in proportion to their own surface, while they collect the waters that fall on the vast extent of surrounding lands. In the volume of water which hydraulic works require, we must distinguish between that which depends on the capacity of the

* See above, Vol. iv, p. 148.

† *Ducros Memoires sur les quantités d'eau qu'exigent les canaux de navigation*, 1800, No. II. p. 41.

whole canal, that is, its length and section, and that which is determined by the locks, that is by the lockage water * of one sluice, or by the quantity of water which falls from the upper into the lower channel every time a vessel passes through a lock. These two volumes of water lose by evaporation and filtration; the latter, which it is very difficult to estimate, diminishes with time. The length and depth of an *oceanic canal* in the New World, must consequently have an influence on the volume of water necessary to fill it at the beginning, when the excavations are just terminated, or after having shut up the sluices, when repairs are necessary; but the quantity of water which should feed the canal annually, after making allowance for the losses caused by the filtration and evaporation, depends on the number of the *locks*, or on the relation between the quantity of the *lockage water* of one lock, and the

* In the collected *locks* we must add the *floating prism*, or the volume of water in which the ship floats, or is suspended in its passage from one lock to another. (Prony, in the works of *M. Huenè de Pommeuse*, p. 23.) The consumption of water is therefore greater in going up than descending. The distribution of the falls, or the height of the successive basins, have also an influence on the waste of water in a canal, as M. Gérard has recently shewn. (*Annales de Physique et de Chimie*, 1823, Tom. xxiv, p. 137, and *Ducros, Memoires*, p. 39.)

activity of the navigation. The heavier the tonnage of ships, the less frequent will be their passage. I dwell on these technical considerations to remove the apprehension of wanting a sufficient volume of water to feed a canal of considerable length; and if it be meant to serve at the same time for small boats filled for inland trade, locks of less dimensions might be added to the great *locks*, in order to œconomize the waters, which has been practised on the Grand Junction canal, and was projected for some time on the Caledonian canal *.

* The capacity of the canal of Languedoc, or the *prisme de remplissage* of the whole canal, is seven millions of cubic inches, according to the calculations of M. Clauzade. The annual expence of the locks, for 960 double passages of boats, was 11½ millions m. c. This expence, caused by locks somewhat too large for a very active given navigation, and in small boats, is consequently to the capacity of the canal as 1½ : 1. It requires besides, 3½ millions m. c. to re-establish the waters after the shutting up as far as Fresquel, and that quantity of water is furnished in 9 days, by the upper basin, or the artificial source. (*Huerne de Pommeuse*, p. 256, 258, 265.) The product of the evaporation is estimated in the canal, the reservoirs and the trenches, during 320 days of navigation, 1,900,000 m. c. (*Ducros Mem.*, p. 41.) In comparing the Caledonian canal with that of Languedoc, I find the surface of the sections as 5 to 1; and the length of the parts dug in the canal, (excluding the navigable line of the lakes of Scotland), as 1 : 6½. It results from these statements, that the capacities of the two canals, one of which bears flat-ribbed boats, of 100 to 120 tons, and the other

It appears somewhat probable that the province of Nicaragua will be fixed upon for the great work of the junction of the two Oceans; and in that case it will not be necessary to form a line constantly navigable. The isthmus to be passed over, is only from 5 to 6 marine leagues; there are some hills in the narrowest part, between the western bank of the lake of Nicaragua, and the gulph of Papagayo; but it is formed of uninterrupted savannahs and plains, affording an excellent road for carriages * (*camino ceratero*) between the town of Leon, and the coast of Realexo. The lake of Nicaragua is elevated above the South Sea, the height of the whole fall of the Rio San Juan, on a length of 30 leagues; and the position of this vast basin is so well known in the country, that it was considered heretofore as an invincible obstacle to

frigates of 32 guns, are almost the same; the difference of the waste of water in *lockages* arises from that of the body of water required for filling each lock; the locks being in the Caledonian canal 37 feet broad between the gates, and 160 feet long; in the canal of Languedoc 31 feet broad in the middle, 20 feet between the gates, and 127 feet long. We have seen above, that the dimensions of the canal of junction in America may be less than that of the great canal of Scotland.

* This is the great road by which merchandize is sent from Guatimala to Leon, embarking in the gulph of Fonseca or Amapala, to Conchagua, port of the *Partido* of San Miguel.

the project of a canal, from the fear of an impetuous flowing towards the west, or a diminution of the waters in the Rio San Juan, where, above the ancient Castillo de San Carlos *, are rapids, that are dangerous in time of drought. The art of engineering is sufficiently improved in our days to have no apprehension of such dangers. The lake of Nicaragua may serve as an upper basin, like the lake Oich in the Caledonian canal, and regulating sluices will furnish only as much water for the canal as it requires. The small difference of level between the Atlantic and the Pacific Oceans, depends, as I have said elsewhere †, only on the unequal height of the tides. The same difference is observed between the two seas that are joined by the great canal of Scotland; and if it were six toises, and constant like that of the Mediterra-

* This small fort, taken by the English in 1665, is vulgarly called El Castillo del Rio San Juan. It is placed, according to Mr. Juarros, at 10 leagues distance from the eastern extremity of the laguna de Nicaragua. Another small fort was constructed in 1671, on a rock at the mouth of the river. It bears the name of *Presidio del Rio de San Juan.* Even in the 16th century, the *Desaguadero de las Lagunas,* had fixed the attention of the Spanish government, who ordered Diego Lopez Salcedo to found the town of Nueva Jaen, near the left bank of the *Desaguadero,* or Rio San Juan; but it was soon abandoned, like the town of Brussels (*Bruselas*), near the gulph of Nicoya.

† Political Essay on New Spain, Vol. i. p. 32.

nean, and the Red Sea*, it would not less favor the establishment of an oceanic junction. The winds blow with sufficient force on the lake of Nicaragua, to render it unnecessary to tow the ships which pass from one sea to the other, by means of steam-boats; but the employment of the moving power of steam would be of the greatest utility in the passage from Rialexo and Panama to Guayaquil†, where, during the months of August, September, and October, calms alternate with winds that blow in a contrary direction.

In stating my ideas on the junction of the two seas, I have calculated only on the most simple means, for the execution of so vast a

* Even the ancients surmounted the difficulties of the difference of the level between the Red Sea and the pelusiac branch of the Nile, although they were ignorant of locks, and only knew at the utmost, how to stop up the *euripes* with small beams.

† From 14 to 15 feet broad. According to the project of M. Laurent, the subterraneous canal would have been, without interruption, 7000 toises (nearly three leagues) long, 21 feet broad, and 24 feet high. Its length would have surpassed by one sixth that of the famous gallery of mines of Clausthal (the George Stollen), at Harz. In order to shew what men can achieve in this kind of subterraneous labor, I shall again mention the two great draining galleries of the district of the mines of Freiberg in Saxony, one of 29,504 toises, and the other 32,433. If the latter were pierced in a straight direction, it would pass over a space nearly double the breadth of the Pas-de-Calais.

project. Steam-engines for feeding the basins of partition, subterraneous tunnels, as they were proposed in the mountainous part of the isthmus of Panama, and like those of the canal of Saint Quentin, which has one of 2900 toises in length *, belong preferably to inland lines of navigation. It is sufficient for me to have shewn the practicability of an oceanic canal in central America; the estimate of the expence of its construction, of the labor of clearing the ground, and forming banks, locks, basins, and feeding trenches, must depend on the choice of the localities. The Caledonian canal, the most admirable work hitherto executed, cost nearly 3,900,000 piastres, which is 2,700,000 piastres less than the canal of Languedoc †, reducing the mark of silver to the present currency of money. The sketch of the general expence of the works of the canal of Suez, projected by M. Le Pere at the period of the expedition of Buonaparte to Egypt, amounted to 5 or 6 millions of piastres, of which a third would have belonged to the subsidiary canals of Cairo and Alexandria. The isthmus of Suez, reckoning that part which has never been

* *Huerne de Pommeuse*, p. 112.

† L. c. p. 308. The keeping of this canal, from 1686 to 1791, has cost besides, the sum of 23 millions of francs, (*Andreossy*), *Deber. du Canal du Midi*, p. 289).

reached by the tides, at 59,000 toises, (more than 20 marine leagues) of breadth, and the projected canal with four locks *, might receive vessels during several months of the year (which the risings of the Nile last), drawing from 12 to 15 feet of water. Now, in supposing that the canal for joining the seas in the New World, were to occasion an equal expence with those of Languedoc, the Highlands of Scotland, and Suez, I do not believe that this consideration would retard the execution of so great a work. The New World already furnishes examples of works no less considerable. The state of New York alone, has, in the space of six years, caused a canal to be dug between the lake Erie and the river Hudson, more than an hundred leagues long, of which the expence was estimated at nearly 5 millions of piastres †, in a report ad-

* *Description de l'Egypt* (*Etat moderne*), 1808, Tom. i, 50, 60, 81, 111. The ancient canal from the Red Sea to the Nile, (*Canal des Rois*), navigable, if not under the Ptolemies, at least under the Khalifs, was only a derivation of the pelusiac branch, near Bubaste; it had a developement of 25 leagues. Its depth was sufficient for ships of great burthen, and that could navigate on the sea; it appears to have been at least from 12 to 15 feet.

† *Warden. Description of the United States*, Vol. ii. p. 197. *Morse, Modern. Geogr.* 1823, p. 122. This canal, 294,590 toises long, is only 4 feet deep, ($\frac{1}{3}$ of that of Languedoc, of which the length is 123,730 toises.) The lake Erie is 88 times above the mean waters of the river Hudson. The

dressed to the provincial legislature. When we consider in one view the gigantic works, little indeed to be praised, which have been executed within two centuries, for diminishing the waters of the lakes in the valley of Mexico, we conceive that with the same labor, the isthmus of Nicaragua and Huasacualco might have been cut, perhaps even that of Panama, between Gorgona (on the Rio Chagre), and the

boats first descend uniformly, by 25 locks, from Buffalo on the lake Erie, to Montezuma, on the river Seneca (passing by Palmyra and Lyon on a length 166 English miles), 30 toises of perpendicular fall; they then ascend 8 toises from Montezuma to Rome, on the Mohawk, for 77 miles, and finally, descend again 66 toises without discontinuing, by means of 46 locks, on a length of 113 miles, from Rome to Albany, on the river Hudson, passing by Utica. This latter descent is consequently 9 toises less than that made by the boats of the basin of partition of the canal of Languedoc in the Mediterranean. I shall again mention on this occasion, the *maximum* of the slope which I went up on a *natural navigable line*, in the bed of one of the greatest rivers of South America, destitute of cataracts and rapids. You go by rowing on the Rio Magdalena, from Carthagena to Honde, after having vanquished 135 toises of fall, which is one half more than the fall of the lake Erie to the river Hudson, and by the Magdalena, a navigable line, one third longer. In reflecting on the small slope of the Rio Magdalena de Morales at its mouth, we may conceive that without locks, a boat may proceed, by a natural navigable line, 80 marine leagues, on a table-land of 100 toises, which will give 44 of fall by 1000 toises of current.

coast of the South Sea. In the year 1607, a subterraneous canal was dug 3400 toises long, and 12 feet high, on the north of Mexico, on the other side of the hill of Nochistongo. The viceroy, Marquis of Solinas, passed along half its length on horseback. The open trench (*tajo de Huehuetoca*) which now leads the waters out of the valley, is 10,600 toises long, of which a considerable part is dug in a moveable earth; it has 140 and 180 feet of perpendicular depth, and, towards the upper part, is from 250 to 330 feet broad. The expence of these hydraulic works* of the *Desague* of Mexico, amounted, from the year 1607, to the time when I visited them, in January, 1804, to the sum of 6,200,000 piastres. It is little to be apprehended that sufficient money would not be collected for opening an oceanic canal, when we recollect that the family of the Count de la Valenciana alone, had the resolution to dig four shafts † at Guanaxuato, which cost altogether more than 2,200,000 piastres. Even supposing that during a certain number of years, the annual expence

* I have given a detailed account of those works, from official manuscript documents, in my Political Essay, vol. ii, 110, &c.

† *Tiro Viejo, Santo Christo de Burgos, Tiro de Guadalupe, and Tiro general*, their depth is 697, 460, 1061 and 1581 feet, (ancient French measure). See Political Essay, vol. iii, p. 106.

of the cut of the isthmus would amount to seven or eight hundred thousand piastres, that sum would be supported either by the undertakers or by the different states of America, of which the trade would derive inappreciable advantages from the opening of a new way towards Peru, the western coast of Quito, Guatimala, Mexico, Nutka, or the fur-coast, and to China.

With respect to the mode of execution, on which I have been recently consulted by well informed persons belonging to the new governments of Equinoxial America, I believe that a joint stock association can only be formed when the practicability of an oceanic canal capable of receiving vessels of three or four hundred tons, between the latitudes 7° and 18°, has been proved, and the ground fixed upon and recognised. I shall abstain from discussing the question whether this ground "should form a separate republic by the name of *Junctiana*, dependant on the confederation of the United States," as it has been recently proposed in England, by a man whose intentions are always the most praiseworthy and disinterested. But whatever government may claim the soil on which the great junction canal of the Ocean shall be established, the benefit of this hydraulic work ought to belong to every nation of both worlds who shall have contributed to its execution by taking shares. The local governments

of Spanish America can order surveys to be made on the spot, the levelling of the ridge of partition, the measure of the distances, the soundings of the lakes and rivers to be crossed, and the estimate of the springs and rain-waters proper to feed the upper basin. These previous labors will require but a small expence, but must be executed according to a uniform plan, at the isthmuses of Tehuantepec or Goazacoalcos, Nicaragua, Panama, Cupica or Darien, and Raspadura or Choco. When the plans and profiles of these five territories are placed before the public, the persuasion of the possibility of an oceanic junction will become more general in both continents, and will facilitate the formation of a joint-stock company. A free discussion will shew clearly the advantages and disadvantages of each locality, and will soon lead to the fixing on two, or perhaps, on one sole point. The junction company will then submit the local circumstances to a second and more rigid examination; the expence will be estimated, and the execution of this important work confided to engineers who have practically engaged in executing similar works in Europe.

As there seems to be no doubt that in case of the impracticability of an *oceanic canal*, *canals of small section* might be dug in some of the five points we have named, to the great profit of the share-holders, it would perhaps be advan-

tageous to make the first survey at the expence of an association. A ship might transport the engineers and their instruments successively to the mouth of the Atrato, Rio Chagre, the bay of Mandinga, Rio San Juan, the lake of Nicaragua, and the isthmus of Huasacualco, or Tehuantepec. The facility of the operations, and the appreciation of the advantages of the different spots of which the comparison is to be made, would gain in celerity by this mode of a more uniform levelling; and *the association of the first survey*, after having fixed on the spot to be preferred, and the magnitude of the work, according to the tonnage of the ships or boats to be employed, would make an appeal to the public to augment the fund, and constitute an *association of execution*, either, as we have reason to hope, for a *canal of oceanic navigation*, or for canals or *lines of small navigation*. In adopting the mode of execution which I have just stated, all that prudence prescribes would be complied with in an affair that interests the commerce of both worlds. The *junction company* would find funds from governments and enlightened citizens, who, insensible to the allurements of gain, and yielding to noble impulses, would be proud of the idea of having contributed to a work worthy of modern civilization. It is also well to remember in this place, that the attraction of gain, the funda-

mental basis of all financial speculations, is not illusory in the enterprize for which I warmly plead. The dividends of the companies in England who have obtained the grant of opening canals, prove the utility of these enterprizes, even for the share-holders. The tax of tonnage in a canal of junction of the seas, may be so much more considerable as the ships which profit from the new passage in going to the fishery of Lima, Cachelot, or to the north-west coast of America, and thence to Canton, would considerably shorten their way, and avoid the high southern latitudes, dangerous in the bad seasons. The activity of the passage would augment in proportion as traders became more familiarized with the new direction from one ocean to the other. Even if the dividends were not sufficiently considerable, and the capitals placed in this enterprize did not bear the interest offered for the numerous loans made by governments, from the coast of the Mosquito Indians, to the last confines of Europe, it would be the policy of the great states of Spanish America, to give this enterprize their support; since it would be fogetting all that experience and political economy have taught for ages, to restrain the utility of canals and high roads, to the duties paid by the transport of merchandize, and to count for nothing the general in-

fluence exerted on industry, and national prosperity *.

When we study attentively the history of the commerce of nations, we observe that the direction of the communications with India has not been changed solely according to the progress of geographical knowledge, or the improvement of the art of navigation, but that the change of the seat of civilization in the world has also powerfully contributed to this effect. From the time of the Phenicians to that of the British empire, the activity of commerce has been carried progressively from east to west; from the eastern coast of the Mediterranean to the western extremity of Europe. If this change continues moving towards the west, which every thing leads us to presume, the question on the preference given to the way to India by the southern extremity of Africa, will no longer be such as it now is. The canal of Nicaragua affords additional advantages to ships going from the mouth of the Mississipi, beyond what it promises to those which take in their lading on the banks of the Thames. In comparing the

* It is with respect to this benevolent influence that the works, far too expensive, of the canal of Languedoc must be appreciated, which cost 33 millions of franks, and produces annually, on a bare revenue of 1½ millions, only 800,000 franks, scarcely 2½ per cent. on the capital. Such is also the net produce of the Canal du Centre.

different routes round the Cape of Good Hope, round Cape Horn, or across a cut of the isthmus of central America, we must carefully distinguish between the objects of trade, and the nations engaged in it. The problem respecting the way presents itself in a manner altogether different to an English merchant, and to an Anglo-American; as the problem regarding Chili, must be differently solved by those who trade directly with India and China, or those whose speculations are directed either towards northern Peru and the western coast of Guatimala and Mexico, towards China, after having visited the north-west coast of America, or towards the fishery of Cachelot in the Pacific Ocean. These three latter objects of the navigation of the nations of Europe and of the United States, would be the most indubitably benefited by the cutting of an American isthmus. From Boston to Nootka *, the antient centre of the fur-trade in otter skins, on the north-west coast of America, across the projected canal of Nicaragua, will be 2100 marine leagues; the same voyage is 5,200 leagues, if made, as it has been hitherto,

* In these estimates of distance, I have supposed, conjointly with M. Beautemps Beaupré (engineer in chief of the royal marine), the way to be nearly straight; this was sufficient to obtain comparative numbers. If itinerary distances are desired, we must augment the passages according to the contrariety of winds and currents, one-third or one-seventh.

by going round Cape Horn. These distances are from 3000 to 5000 leagues for a vessel going from London. From these statements, there results a shortening for the Americans of the United States of 3,100 leagues; and for the English of 2000 leagues; without including the chance of contrary winds, and the dangers of a navigation so different in the two ways which we are contrasting. The comparison is much less favourable across central America, with respect to space and time, for a direct trade with India and China. From London to Canton, going round the Cape of Good Hope, and passing the equator twice, is usually a voyage of 4,400 leagues; from Boston to Canton, 4,500; if the canal of Nicaragua were dug, the length of way would be 4,800, and 4,200 marine leagues *. Now, in the present improved state of navigation, the ordinary duration of a voyage from the United States, or from England, to China, round the extremity of Africa, is from 100 to 130 days †. In founding the calculations on the analogy of the voyages from Boston and Liverpool to the coast of the Mosquito Indians,

* It is 5,800 leagues from London to Canton, by Cape Horn; 1400 leagues more than by the Cape of Good Hope. From Boston to Canton by Cape Horn, is 5000 leagues.

† Some rare examples of 98 days have been known at Boston. *Warden, Description of the United States*, vol. v, p. 596.

and from Acapulco to Manilla*, we find from 105 to 115 days for the voyage from the United States, or from England to Canton, in remaining in the northern hemispliere, without once cutting the equator; that is, in taking advantage of the canal of Nicaragua, and the constancy of the trade-winds in the calmest part of the Pacific Ocean†. The difference of time would therefore scarcely be a sixth; vessels could not return by the same way, but in going the navigation would be safer at all seasons. A

* The Galleon takes from 40 to 60 days. See my *Pol. Essay*, vol. iv, p. 71; and *Tuckey, Maritime Geogr.* vol. iii. p. 497.

† In these estimates of time, the employment of the power of steam has not been calculated. The French engineers who made an estimate of the expence of the canal of Suez, admit, in their parallel between the navigation from the coast of France to India, across the projected canal, and the passage round the Cape of Good Hope, that by the former way, half the distance is gained, and $\frac{1}{3}$ or $\frac{1}{4}$ of time. *Descript. de l'Egypte*, (*Etat. moderne*), tom. i, p. 111. It were to be wished that the *mean duration* of the passage from London to Calcutta and Canton, and from Liverpool to Buenos Ayres and Lima, (and *vice versa*), were calculated with precision; taking a sufficient number of years and ships to make the influence of seasons, winds, currents, the construction of vessels, and the errors of piloting, disappear in the total average. The duration of passages is one of the most important elements of the movement of commercial nations, that vital movement which augments from age to age with the improvement of the art of navigation.

nation possessing fine settlements at the extremity of Africa and the Isle de France, would, I believe, in general prefer the passage from west to east. The principal and real object of the opening of the isthmus is the prompt communication with the western coast *, of America,

* We must except, however, the coast of Peru, south of Lima, and that of Chili, which it is extremely difficult to ascend from north to south. The passage would be quicker from Europe to Valparaiso and Africa, by Cape Horn, than by the canal of Nicaragua. The canal will be advantageous for the trade of the western coast south of Lima only when the coasting is made by steam-boats. The trade of North America with China, in its present state, is carried on by the three following means: 1st, The vessels of the United States, loaded with piastres, go directly from New York or Boston by the Cape of Good Hope to Canton, where they purchase tea, nankeen, silks, china, &c. and return by the same route; 2dly, the vessels that go round Cape Horn, either for the seal and sea-horse fishery in the South Sea, or to visit the north-west coast of America; if they have not obtained a sufficient quantity of furs, they take sandal-wood, or ebony in Polynesia, carry those productions to Canton, and go back by the Cape of Good Hope; 3dly, other vessels carry on a smuggling trade for several years, visiting successively Madeira, the Cape of Good Hope, the Isle of France, or New South Wales, some ports of South America, and the islands of the Pacific Ocean; in going, they sometimes double the Cape of Good Hope, sometimes Cape Horn; but as they constantly touch at Canton at the end of this long voyage, they return to the United States by the southern extremity of Africa. The opening of the isthmus will have a powerful influence on the two latter passages, which we have just pointed out.

the voyage from the Havannah, and the United States to Manilla, the expeditions made from England and the Massachusets to the fur-coast (north-west coast) or to the islands of the Pacific Ocean, to visit afterwards the markets of Canton and Macao.

I shall add to these commercial considerations some political views on the effects which the projected junction of the seas may produce. Such is the state of modern civilization, that the trade of the world can undergo no great changes that are not felt in the organization of society. If the project of cutting the isthmus that joins the two Americas, should succeed, Eastern Asia, at present insulated and secure from attack, will inevitably enter into more intimate connections with the nations of European race which inhabit the shores of the Atlantic. It may be said, that that neck of land against which the equinoxial current breaks, has been for ages the bulwark of the independence of China and Japan. In penetrating farther into futurity, imagination dwells upon the conflict between powerful nations, eager to obtain exclusive advantages from the way opened to the commerce of the two worlds. I confess I am not secured from that apprehension either by my confidence in the moderation of monarchical or of republican governments, or by the hope, somewhat shaken, of the progress

of knowledge, and the just appreciation of human interests. If I abstain from discussing political events that are so distant, it is to avoid flattering my reader with ideas of the free enjoyment of what yet exists only in the wishes of some men interested in the public good.

The lake of Nicaragua and the Rio San Juan do not, as it has been affirmed in some ancient works, belong to the territory of New Grenada; the lake is separated from the Columbian territory of Veragua, by Costa-Rica, the most southern province of the ancient kingdom of Guatimala. Placed in a country thinly peopled, especially towards the east, and almost on the confines of the two independent states of central, and southern America, the great works which must be established for the junction of the two seas, will have no military defence but from Portobello and Carthagena, two fortresses to the windward of Castillo de San Juan de Nicaragua. There is indeed a road by land, from Guatimala to Léon, but the distance is more than 135 leagues. In the present state of things, it is less the strong places than the misery of the country, its want of culture, and the force of vegetation, which from Darien to the 10th and 11th degree of north latitude, have rendered unavailing the invasions of an enemy who disembarks suddenly on the eastern coast. In treating this important question, I cannot rest

upon a more solid testimony than that of general Don Josè de Espeleta, who was viceroy of New-Grenada till 1796. This experienced officer, in a manuscript memoir, which is addressed to his successor, the viceroy Don Pedro de Mendinueta *, thus expresses himself on the defence of the isthmus of Panama: "Your Excellency is informed that the king has caused his vast possessions in America to be visited by the Brigadier Cramer. That celebrated engineer has calculated the dangers to which we are still exposed, and indicated the fortifications which must be erected for defence. The isthmus of Panama is of the highest military importance, of which your Excellency ought not to lose sight for one instant. Its importance is founded on its geographical configuration, and its proximity to the South Sea; it presents three points of defence, Portobello, and the small fort of San Lorenzo de Chagre towards the north, and the town of Panama towards the south. The heights which command Portobello render it impossible to fortify to any good purpose that poor and ill-peopled town; the batteries of San Fernando, Santiago, and San Geronimo, appear to me sufficient for the defence of the port. The small fort of Chagre, at the mouth of the

* *Relacion del Govierno, Parte quarta*, Cap. III., fol. 118, 122, 123 (manuscript).

river of that name, is in my opinion, the principal point of the isthmus, in the most natural supposition that the attack comes from the north; but neither the taking of Portobello nor the fort of San Lorenzo de Chagre, would determine the possession of the isthmus of Panama. The real defence of that country consists in the difficulty which every considerable expedition will find in penetrating into the interior. On the southern coast, which is entirely unpeopled, this difficulty already exists for two or three insulated travellers."

After having discussed the extent of the surface, the population, the productions, and the trade of the United-Provinces of Venezuela, in their present state as well as in their more or less distant increase, it remains for me to speak of the finances, or the revenue of the state. This object is of such political importance, that it comprehends one of the first conditions of the existence of a government; but after long civil dissensions, after a war of thirteen years, during which agriculture has retrograded, commercial relations have been shackled, and the principal sources of public revenue dried up, we can only describe a state of things altogether transitory, and little conformable to the natural riches of the country. In order to take a more certain point of departure for judging of the state of things when confidence and tran-

quillity shall be re-established, we must go back again to the period which preceded the revolution. The annual average of the clear receipts of the whole contributions, from 1793 to 1796, without comprehending the farm of tobacco, was 1,426,700 piastres. In adding to this, 586,300 piastres as the net product of the farm (the average of the same period), we find the revenue of the *Capitania general de Caracas*, deducting the expence of collecting, to be 2,013,000 piastres. This revenue has gone on diminishing, on account of the difficulties of maritime trade, in the last years of the 18th, and the first years of the 19th century; but from 1807 to 1810 it rose to more than 2,500,000 piastres (of which 1,200,000 piastres arose from the customs, 700,000 from the farm of tobacco, and 400,000 from the alcavala of land and sea). All these receipts were absorbed by the expence of the administration; sometimes a surplus of 200,000 piastres was poured into the treasury of Madrid, but these examples were extremely rare. Since Caraccas has no longer received the *situado* of New-Spain, resources have from time to time been drawn from the no less impoverished bank of Santa-Fe. The gross revenue of all the provinces which now form the republic of Columbia, amounted, according to my researches, at the moment of the revolution,

to a *maximum* of 6½ millions of piastres*, of which the government of the mother-country never drew more than a twelfth. I have shewn, in my Political Essay, that the Spanish colonies in America, at the period of the greatest activity of commerce and the mines, *had a gross revenue of thirty-six millions of piastres; that the internal administration of the colonies absorbed nearly twenty-nine, and that only from seven to eight millions of piastres flowed into the royal treasury of Madrid.* From these statements, founded on official documents, and of the exactness of which no doubt has been entertained during fifteen years, we are surprised to find that in grave discussions on political economy, the financial embarrassments of the mother-country are still attributed so often to its separation from its colonies. The duties on importation and exportation are, throughout America, the principal source of public revenue; that source is become progressively more abundant since the court has deprived the company of Guipuzcoa of the monopoly of trade with Venezuela; a company in which, according to the singular expression of a *royal cedule*, "every body may take part without derogating from

* Don Jose Maria del Castillo, in his report to the Congress of Bogota (5th May, 1823) estimates *las rentas ordinarias* at present, at only 5 millions of piastres.

nobility; and *without losing honor or reputation.*" If we reflect that of late years the custom-house of the Havannah only, has collected more than three millions of piastres; and if we consider at the same time the extent of the territory, and the agricultural wealth of Venezuela, we cannot doubt of the progressive increase of the public revenue in that fine part of the world; but the accomplishment of this hope, and every other we have announced, depends on the return of peace, and on the wisdom and stability of the institutions that are established.

I have stated in this chapter the statistical elements which I had occasion to collect in my travels, and by my uninterrupted intercourse with the Spanish-Americans. As the historian of the colonies, I have presented facts in all their simplicity; the attentive and exact study of those facts being the only means * of laying aside vague conjectures, and vain declamations. This wary manner becomes the more indispensable at a moment when we may be tempted to yield too easily to the predilections of hope, and of ancient affections. Dawning societies possess something of the charm of youth; they have its glowing sentiments, its ingenuous confidence, and even its credulity; they offer a

* *Recherches statistiques sur la ville de Paris*, 1823, Introd. p. 1 et 5.

more powerful attraction to the imagination than the querulous temper, and distrustful austerity of old nations which seem to have worn out every thing, their happiness, their hope, and their belief in human perfectibility.

The great struggle during which Venezuela has fought for its independence, has lasted more than twelve years. That period has been fruitful, as civil commotions are for the most part, in heroism, generous actions, guilty errors and irritated passions. The sentiment of common danger has strengthened the ties between men of various races, who, spread over the steppes of Cumana, or insulated on the table-land of Cundinamarca, have a physical and moral organization as different as the climate under which they live. The mother-country has several times regained possession of some districts; but as revolutions are always renewed with more violence when the evils that produce them can no longer be remedied, these conquests have been transitory. In order to facilitate and give greater energy to the defence of this country, the governing powers have been concentrated, and a vast state has been formed from the mouth of the Oronooko to the other side of the Andes of Riobamba, and the banks of the Amazon. The *Capitania-general* of Caraccas has been united to the vice-royalty of New Grenada, from which it was only separated entirely in

1777. This union, which will be always indispensable for external safety, this centralization of powers in a country six times larger than Spain, has had political combinations for its motive. The calm progress of the new government has justified the wisdom of those motives, and the Congress will find still fewer obstacles in the execution of its beneficent projects for national industry and civilization, in proportion as it can grant more liberty to the provinces, and make them feel the advantages of institutions which they have purchased at the price of their blood. In every form of government, in republics as well as in tempered monarchies, ameliorations in order to be salutary must only be progressive. New-Andalusia, Caraccas, Cundinamarca, Popayan, and Quito, are not confederated states like Pensylvania, Virginia, and Maryland. Without *juntas*, or provincial *legislatures*, all those countries are directly subjected to the congress and government of Columbia. According to the constitutional act (art. 152), the intendants and governors of the departments and provinces are named by the president of the republic. It may be naturally supposed that such dependence has not always appeared favorable to the liberty of the communes, which tend to discuss themselves their local interests, and that it has sometimes occasioned debates which may be

termed geographical. The ancient kingdom of Quito, for instance, is connected at the same time, by the habits and language of its mountainous inhabitants, with Peru and New-Grenada. If there were a provincial *junta*, if they resorted to the congress only for the taxes that are necessary for the defence and general welfare of Columbia, the feeling of an individual political existence would render the inhabitants less interested in the choice of the spot where the central government is placed. The same reasoning applies to New-Andalusia or Guyana, which are governed by intendants named by the President. It may be said that these provinces are hitherto in a position little different from such territories of the United States as have a population below 60,000 souls. Peculiar circumstances, which cannot be justly appreciated at such a distance, have no doubt rendered great centralization necessary in the civil administration; every change would be dangerous as long as the state has external enemies; but the forms useful for defence, are not always those which, after the struggle, sufficiently favor individual liberty, and the development of public prosperity. History proves that this difficulty, when not overcome with prudence, has more than once been the rock against which the enthusiasm and the affections of nations have made shipwreck. Without breaking the

ties which should for ever unite the different parts of the Columbian territory (Venezuela, New-Grenada, and Quito), a partial life may be spread by degrees throughout this great political body, not to divide, but augment its vigor.

The powerful union of North America has long remained insulated, and without touching any states with analogous institutions. Although, as we have observed above, the progress she makes in the direction from east to west, is considerably slackened towards the right bank of the Mississipi, she will advance without interruption towards the *internal provinces* of Mexico; and will there find a European people of another race, other manners, and a different worship. Will the feeble population of those provinces, belonging to another dawning federation, resist, or will it be enveloped by the torrent of the east, and transformed into an Anglo-American state, like the inhabitants of Lower-Louisiana? The future will soon solve this problem. On the other hand, Mexico is separated from Columbia only by Guatimala, a country of extreme fertility, and which has recently assumed the denomination of the republic of Central America. The political divisions between Oaxaca and Chiapa, Costa Rica and Veragua, are not founded either on the natural limits, or the manners and languages of the

natives, but solely on the habit of dependence on the Spanish chiefs who resided at Mexico, Guatimala, or Santa-Fè de Bogota. It appears natural enough that Guatimala may one day join the isthmuses of Veragua and Panama to the isthmus of Costa-Rica; and Quito connect New-Grenada with Peru, as la Paz, Charcas, and Potosi link with Buenos-Ayres *. The intermediate parts which we have just named, from Chiapa to the Cordilleras of Upper Peru, form the passage from one political association to another, similar to those transitory forms, by which the various groups of the organic kingdom are linked in nature. In neighbouring monarchies the provinces that touch each other present those striking demarcations which are the effect of a great centralization of power; in confederated republics, states that are placed at the extremities of each system, are for some time in oscillation before they acquire a stable equilibrium. It would be almost indifferent to the provinces between Arkansa and the Rio del Norte, whether they send their deputies to Mexico or to Washington. If Spanish America were one day to shew more uniformly the tendency towards federalism, which the example of the United States has already excited on several points, from the contact of so many sys-

* See above, vol. vi, p. 169.

tems or groupes of states, confederations variously graduated would result. I here only touch on the relations that arise from this singular assemblage of colonies on an uninterrupted line of 1600 leagues in length. We have seen in North America, an old atlantic state divided into two, and each having a different representation. The separation of the Maine and the Massachusets, in 1820, was made in the most peaceable manner. Schisms of this kind will no doubt frequently occur in the Spanish colonies; but their moral state will, it may be feared, render such changes turbulent. When a people of European race naturally incline towards provincial and municipal independence, while the copper-colored natives have a no less decided taste for political divisions of territory, and the liberty of small communes, the best form of government is that which, without openly struggling against a national predilection, renders it the least hurtful to the general interest, and the unity of the whole body. It may be observed further, that the importance of the geographical divisions of Spanish America, founded at the same time on the relations of local position, and the habits of several centuries, have prevented the mother-country from retarding the separation of the colonies by attempting to establish Spanish princes in the New World. In order to rule such vast pos-

sessions it would have been requisite to form six or seven centres of government, and that multiplicity of centres, (vice-royalties and captaincies-general), was hostile to the establishment of new dynasties at the period when they might still have produced some salutary effect for the mother country.

Bacon * has said, in his Political Aphorisms, that "it would be happy if nations would always follow the example of time, the greatest of all innovators, but who acts calmly, and almost without being perceived." This happiness does not belong to colonies when they reach the critical period of their emancipation; and least of all to Spanish America, engaged in the struggle at first, not to obtain its complete independence, but to escape from a foreign yoke. May the agitations of party be succeeded by a double calm! May the germ of civil discord, disseminated during three centuries to secure the dominion of the mother country, be stifled by degrees; and productive and commercial Europe become more persuaded, that to perpetuate the political agitations of the New World would be to impoverish itself, in diminishing the consumption of its productions, and depriving itself of a market which already amounts

* See the article of Innovations, in *Bacon's Essays civil and moral*, No. 25. (*Opera omnia*, 1730, vol. iii, p. 335.)

to more than 70 millions of piastres. The exports from Spanish America, the United States, France, and Great Britain, are at present as the numbers $1,1\frac{3}{100}$, $1\frac{40}{100}$ and $3\frac{75}{100}$*. Many years must no doubt elapse before 17 millions of inhabitants, spread over a surface a fifth greater than the whole of Europe, will have found a stable equilibrium in governing themselves. The most critical moment is that when nations, after long

* I have shewn in another work (*Political Essay*, vol. iv, p. 129), that in 1805, making the most moderate calculations, Spanish America already stood in need of an importation of foreign merchandize to the amount of 59,000,000 piastres, a value nearly three times greater than that required by the United States, eight years after their independence had been recognized by Great Britain. To give a view of comparative numbers, I shall state the imports and exports of the two most commercial nations of the world, the English of Europe, and of America. The annual value of the imports of Great Britain, from 1821 to 1823, amounted to 30,203,000 pounds sterling; the value of the exports to 50,636,800 pounds sterling. The exports of the United States, in 1820, were 69,974,000 dollars; the imports 62,586,000 dollars. At an anterior period, from 1802 to 1804, the exports were, mean year, 68,461,000 dollars, and the imports 75,306,000 dollars; whence it results that the imports of the United States, and of Spanish America, immediately before the political agitations of the latter country, were alike considerable. It must not be forgotten, that what is imported to Spanish America, is there used, and not re-exported. The exports and imports of France in 1821, were respectively 404,764,000, and 394,442,000 franks.

servitude, find themselves suddenly at liberty to dispose of their existence for the improvement of their prosperity. The Spanish Americans, it is unceasingly repeated, are not sufficiently advanced in intellectual cultivation to be fitted for free institutions. I remember that at a period little remote, the same reasoning was applied to other nations, who were said to have made too great a progress in civilization. Experience, no doubt, proves that nations, like individuals, find ability and learning often unavailing to happiness; but without denying the necessity of a certain mass of knowledge and popular instruction for the stability of republics or constitutional monarchies, we believe that stability to depend much less on the degree of intellectual improvement than on the strength of the national character; on that proportion of energy and tranquillity, of ardor and patience, which maintains and perpetuates new institutions; on the local circumstances in which a nation is placed; and on the political relations of a country with the neighbouring states.

If all modern colonies, at the period of their emancipation, manifest a tendency more or less decided for republican forms of government, the cause of this phenomenon must not be attributed solely to a principle of imitation, which acts still more powerfully on masses of men than on individuals. It is founded principally

on the position in which a community is placed suddenly detached from a world more antiently civilized, free from every external tie, and composed of individuals who recognize no political preponderance in the same caste. The titles conferred by the mother country on a small number of families in America, had not formed what is called in Europe an aristocracy of nobility. Liberty may expire in anarchy, or by the transitory usurpation of a daring chief; but the true elements of monarchy are no where found in modern colonies: those elements were imparted to Brazil at the moment when that vast country enjoyed profound peace, while the metropolis had fallen under a foreign yoke.

In reflecting on the chain of human affairs, we may conceive how the existence of modern colonies, or rather how the discovery of a half-peopled continent, in which alone so extraordinary a development of the colonial system was possible, must have led to the revival on a great scale, of the forms of republican government. The changes which social order has undergone in our days in a considerable part of Europe, have been regarded by some celebrated writers as the tardy effect of the religious reformation at the beginning of the 16th century. We must not forget that the memorable epocha when ardent passions, and a taste for absolute dogmas, were the rocks on which European poli-

tics were shipwricked, was the epocha also of the conquest of Mexico, Peru, and Cundinamarca; a conquest which, according to the noble expressions of the author of *l'Esprit des Lois*, leaves the mother country an immense debt to pay in order to acquit itself towards human nature. Vast provinces opened to colonists by Castillian valour, were united by the ties of a common language, manners, and worship. Thus, by a strange coincidence of events, the reign of the most powerful and absolute monarch of Europe, Charles the Fifth, prepared the struggle of the 19th century, and laid the basis of those political associations, which, though scarcely traced, astonish us by their extent, and the uniform tendency of their principles. If the emancipation of Spanish America be consolidated, as every thing hitherto leads us to hope, the Atlantic will display on its opposite shores, forms of government which are not necessarily hostile because they are different. The same institutions cannot be salutary to every nation of both worlds, and the growing prosperity of a republic is no outrage to monarchies that are governed with wisdom, and a respect for the laws and public liberty.

NOTES

TO

THE NINTH BOOK.

Note A.

It being my intention to collect in this work whatever can throw light on the history of the two Americas, I shall state succinctly the results of the most recent researches on the lines of fortification, and the *tumuli* found between the *Rocky Mountains* and the chain of the Alleghanies. The fortifications chiefly occupy the space between the great lakes of Canada, the Mississipi, and the Ohio, from the 44° to the 39° of latitude. Those which advance most towards the north-east are on the Black River, one of the tributary streams of lake Ontario. Towards the west we discover scattered and inconsiderable mountains, in the county of Genesee, but they augment in number and greatness as we advance towards the banks of Cataraugus-creek; and from that creek, they succeed without interruption, west and south-west, on a length of 50 miles. The most remarkable antient fortifications in the state of the Ohio, are: 1st, Newark (Licking County). A very regular octagon, containing an *area* of 32 acres, and connected with a circular circumvallation of 16 acres. The eight great doors of the octagon are defended by eight works placed before each opening. 2dly, Perry County. Numerous walls, not in

clay, but stone. 3dly, Marietta. Two great squares, with twelve doors; the walls of earth are 21 feet high, and 42 feet at their base. 4thly, Circleville; a square with eight doors, and eight small works for their defence, connected with a circular foot, surrounded with two walls and a moat. 5thly. Paint-Creek, at the confluence of the Scioto and the Ohio; the fortifications are partly irregular; one of them contains 62 acres. 6thly. Portsmouth, opposite Alexandria. Vast ruins, disposed on parallel lines, denote that this spot heretofore contained a numerous population. 7thly. Little Miami and Cincinnati, a wall of 7 feet high, and 6300 toises long; it goes from the Great to the Little Scioto. (*Journ. of General Clinton; Western Gazetteer*, p. 108; *Warden, Description of the United States*, Vol. iv. p. 137; *Weekly Recorder of the Ohio*, Vol. ii. No. 42, p. 324; *Med. Repos.* Vol. xv. p. 147; *New Series of the Med. Repos.* Vol. iii. p. 187; *Harris's Tour*, p. 149; *Drake's Picture of Cincinnati*, p. 204; *Mease's Geolog. account of the United States*, p. 478; *Caleb Atwater, in the Archæologia Americana; or Transactions of the American Antiquarian Society of Worcester, Massachusetts*, 1820, p. 122, 141, and 147.). All these square forts are placed as exactly to the east as the Egyptian and Mexican pyramids; when the forts have only one opening, it is directed towards the rising sun. The walls of these lines of fortification are most frequently of earth; but two miles from Chillicothe, in the state of Ohio, we find a wall constructed in stone, from 12 to 15 feet high, and from 5 to 8 feet thick, forming an inclosure of 80 acres. It is not yet precisely known how far those works extend to the west, along the course of the Missouri and the river la Plata; but they are not found on the north of the lakes Ontario, Erie and Michigan, neither do they pass the chain of the Alleghanies. Some circumvallations discovered on the east of that chain on the banks of the Chenango, near Oxford, in the state of New York, may be considered as a very remark-

able exception. We must not confound these military monuments with the mounds or *tumuli* containing thousands of skeletons of a stunted race of men scarcely five feet high. These mounds increase in numbers from the north towards the south; the highest are near Wheeling and Grave-Creek (diam. 300 feet, height, 100 feet); near Saint Louis, on Cahokia-Creek (diam. 800 feet, height 100 feet); near new Madrid (diam. 350 feet); near Washington, in the state of Mississipi, and near Harrison town. Mr. Brackenridge thinks there are nearly 3000 tumuli from 20 to 100 feet high, between the mouth of the Ohio, the Illinois, the Missoury, and the Rio San-Francisco; and that the number of skeletons they contain, indicate how considerable must have been the population heretofore of those countries. These monuments, considered as the places of sepulture of great communes, are most frequently situated at the confluence of rivers, and on the most favorable points for trade. The base of the *tumuli* is round or of an oval form; they are generally of a conical form, and sometimes flattened at the summit as if intended to serve for sacrifices, or other ceremonies to be seen by a great mass of people at once. (See my *Views of the Cordilleras*, p. 35.) Some of these monuments near Point-Creek and Saint Louis, are two or three stories high, and resemble in their form the Mexican *teocallis* and the pyramids with steps, of Egypt and Western Asia. Some of the *tumuli* are constructed of earth, and some of stones (Stone-Mounds), [or Cairns] heaped together. Hatchets have been found on them, together with painted pottery, vases, and ornaments of brass, a little iron, silver in plates (near Marietta), and perhaps gold (near Chillicothe). Some of these mounds are only a few feet high, and are placed at the centre, or in the neighbourhood of the circular circumvallations; they resemble the *cerritos hechos a mano*, which in the kingdom of Quito, near Cayambe, are called *adoratorios de los Indios antiguos*; they were either tribunes for ha-

ranguing the assembled people, or places of sacrifice; and where they are only from 20 to 25 feet high, they may be considered as observatories erected to discover the movements of a neighbouring enemy. (*Arch. Amer.* Vol. ii. p. 185, 189, 246, 210, 168, 178.) The great *tumuli*, from 80 to 100 feet high, are most frequently insulated, and sometimes seem to be of the same age as the fortifications to which they are linked. The latter merit particular attention; I know no where any thing that resembles them, either in South America, or the ancient continent. The regularity of the polygon and circular forms, and the small works intended to cover the doors of the building, are above all remarkable. We know not whether they were inclosures of property, walls of defence against enemies, (*Relat. Histor.* Tom. i. 85), or intrenched camps, as in central Asia. The custom of separating the different quarters of a town by circumvallations, is observed alike in the ancient Tenochtleitian, and the Peruvian town of Chimu, the ruins of which I examined, between Truxillo and the coast of the South Sea. (*Political Essay*, Vol. ii. p. 8). The *tumuli* are less characteristic constructions, and may have belonged to nations who had no communication with one another; they cover both Americas, the north of Asia, and the whole east of Europe; and it is said, are still constructed by the Omawhaws of the river Plata. The skulls contained in the *tumuli* of the United States, furnish means of recognizing almost with certainty, to what degree the race of men by whom they were raised, differed from the Indians who now inhabit the same countries. M. Mitchell believes that the skeletons of the caverns of Kentucky and Tennesee "belong to the Malays, who came by the Pacific Ocean to the western coast of America, and were destroyed by the ancestors of the present Indians, and who were of Tartar race (Mongul)." With respect to the *tumuli* and the fortifications, the same learned writer supposes, with Mr. De Witt Clinton, that

those monuments are the works of Scandinavian nations, who, from the 11th to the 14th century visited the coast of Greenland, Newfoundland, or Vinland, or Drogeo, and a part of the continent of North America. (*View of the Cordilleras*, Vol. i. p. 85.) If this hypothesis be founded, the skulls found in the *tumuli*, and of which Mr. Atwater, at Circleville, possesses so great a number, ought to belong not to the American, Mongul, or Malay race, but to a race vulgarly called Caucasian. The engraving of those skulls, in the Memoirs of the Society of Massachusetts, is too imperfect to decide an historical question so well worthy to occupy the osteologists of both continents. Let us hope that the learned men who now honor the United States, will hasten to convey the skeletons of the *tumuli*, and those of the caverns, to Europe, that they may be compared together, and with the present inhabitants of native race, as well as with the individuals of Malay, Mongul, and Caucasian race; found in the great collections of MM. Cuvier, Sommering, and Blumenbach. In order to advance in these kinds of researches, so important towards the history of the human species, it appears to me that the attention should be directed to three principal points; namely, 1st. To the osteologic comparisons, which cannot be made successfully from drawings, descriptions, or the mere testimony of travellers. The skulls of the ancient inhabitants (of that race believed to be extinct), must be compared with the skulls of the different varieties of the human race; and we must not forget in this comparison, that among the present natives of the new continent some tribes furnish very remarkable varieties of conformation. It may suffice to cite the Tchougaze Esquimaux in the north, whose children are born white; and more to the south, the Chepewyans, the Panis (Apaches) and the Sioux; three nations, which from their traditions and their aspect, Mackenzie, Pike and Lewis, consider as having come from Asia, and being strongly mungolized. (*Mackenzie, See*

Vol. i. p. 275, Vol. iii. 342; *Pike*, p. 274; *Lewis and Clarke*, p. 146); 2dly. To the relations of construction or of geographical position observed between the monuments of the United States, the banks of the Ohio, and the Missoury, and the Mexican mouments of Gila and Nabajoa. The country between the 33° and 41° of latitude, parallel to the mouth of the Arkanzas and the Missoury, is considered by the Azteque historians, as the ancient dwelling of the civilized nations of Anahuac. These historians place the first station of the Mexicans, in the course of their migration from north to south, on the banks of the lakes (fabulous?) of Teguayo, and Timpanogos; the second station is marked by the ruins of the *Casas-Grandes* of Rio Gila, which the fathers Garces and Font have described in detail (*Political Essay*, II. Vol. i. p. 254, and in my Mexican Atlas, maps 1 and 2). These edifices, which occupy a square league, are placed exactly at the four cardinal points, and, like the ancient Kara-Korum, the capital of the Monguls, are surrounded with lines of fortification. The vestiges of great towers are recognized, which are connected by walls built of clay. (This system of defence recalls to mind the military monuments of the United-States; there is, however, a distance of more than 600 leagues from the Casas-Grandes on the Rio Gila to the ancient fortifications of Black-River, a tributary stream of the lake Ontario; 3dly. To the traditions and moral state of the nations which inhabit the country between the right bank of the Mississipi, and the coast of the Pacific Ocean. From Upper Louisiana towards the Rio Columbia, we observe civilization augmenting progressively on the west of the Rocky-Mountains, which are joined by la Sierra Verde and la Sierra de las Grallas, to the Mexican Andes of Anahuac. (*Brackenbridge, Views of Louisiana*, p. 173, *M'Culloch's Researches on America*, p. 203.) The fathers of the seraphic college of Queretaro, found in the year 1773, in the Moqui, traversed by the Rio Yuquesila, a well-peopled

Indian village, with two public squares, houses with several stories, as in the Casas Grandes, and streets in parallel lines. The natives of these countries, near which the *first station* of the Mexican nations is placed, have long beards, like the Ainos (inhabitants of Tarakai) of eastern Asia. These are the Yabipais, whose language differs essentially from that of the Asteques. This analogy of construction among the present and the ancient inhabitants, whatever may be the superiority of the latter in their civilization, is a very curious phenomenon. I know how little confidence can be placed in the narratives of Fray Marcos de Niza; but it cannot be doubted that in the middle of the 16th century, a small centre of civilization was still preserved in the regions situated on the north of New Mexico, at Cibora, and at Quivira. When well-informed travellers shall one day have explored the plains between the Rio Colorado and the Rio Colombia, those plains which the ecclesiastic Escalante went partly over in 1777, it will be important to compare the present state of the country, and above all the names of places, with the detailed journals we possess of the expedition of Francisco Vasquez de Cornado (1540). The Spanish historians give strange variations to the names of places and men in this Mexican *Dorado*; (Harac, Tinhex, Cicuic, Acuc, Huex, Tutonteac, and the name of that king Tatarax, *Señor de las siete ciudades*, who was made a kind of Prester-John; "Hombre barbudo, que rezava en oras, que adorava una cruz de oro, y una imagen de muger, Señora del cielo." (*Gomara, Hist. de las Indias*, 1553, fol. cxvii.; *Herera Decad.* vi, p. 157, 204; *Lact*, p. 297—304; *Viaje al Estrecho de Fuca*, p. 27; *Political Essay*, ii. 277; *View of the Cordilleras and Monuments*, Vol. i, p. 307, 318; *Personal Narrative*, Vol. v. p. 844.) The *Conquistadores* placed Cibora, no doubt vaguely (according to the name of the bisons, *cibolas*, or cows with humps, and long hair, *vacas carcobadas*), in lat. 30° 30′; Quivira, in latitude 40°.

In reading the first Spanish historians with attention, it would appear that the two countries are situated west of the Rocky Mountains; but Cornado states clearly, that in going to the north, the rivers are found to flow, as far as the Cibola, towards the west; and beyond Cibola, as far as Quivira, towards the east. There is no question however, in any of these expeditions to the north, of a passage across the mountains; Quivira is described as an immense plain, where it is difficult to mark the way. Whatever opinion may be formed of the abrupt lowering of the mountains, north of New Mexico, it is difficult to figure, between the Rocky Mountains and the Sierra Verde, a point of partition of the waters, *divortia aquarum*, situated in a plain. Francisco Vasquez de Cornado, in his letter to the viceroy, complains of the falsehoods of the monk Marcos de Niza; and to justify his return, paints the country through which he had passed, as poor and savage: he is, however, so much struck with the grandeur of the edifices at Cibora and Quivira, several stories high, built of stone and clay, that he doubts if the natives, who he says are intelligent but little industrious, could have constructed them. This testimony of a man of veracity is well worthy of attention. Does it indicate a people relapsed into barbarism, and who had preserved some knowledge of the mechanic arts? Every house in Quivira having a flat roof, or a terrace (*azotea*), Cornado calls the whole country "la tierra de las azoteas." Terraces of the same kind were found in 1773, by Father Garces, in the villages of the present Indians of Moqui. Did the nations of the Mexican race, in their migrations to the south, send colonies towards the east, or do the monuments of the United States pertain to the autocthone nations? Perhaps we must admit in North America, as in the ancient world, the simultaneous existence of several centres of civilization, of which the mutual relations are not known in history. The very civilized nations of New-Spain, the Tol-

teques, the Chichimeques, and the Aztequès, pretended to have issued successively, from the 6th to the 12th century, from three neighbouring countries situated towards the north, and called Huehuetlapallan or Tlalpallan, Amaquemecan, and Aztlan or Teo-Alcohuacan. These nations spoke the same language, they had the same cosmogonic fables, the same propensity for the sacerdotal congregations, the same hieroglyphic paintings, the same divisions of time, the same taste (Chinese and Japanese) for noting and registering every thing. The names given by them to the towns built in the country of Anahuac, were those of the towns they had abandoned in their ancient country. The civilization on the Mexican table land was regarded by the inhabitants themselves as the copy of something which had existed elsewhere, as the reflection of the primitive civilization of Aztlan. Where, it may be asked, must be placed that parent land of the colonies of Anahuac, that *officina gentium*, which during five centuries, sends nations towards the south, who understand each other without difficulty, and recognize each other for relations? Asia, north of Amour, where it is nearest America, is a barbarous country; and, in supposing (which is geographically possible) a migration of southern Asiatics by Japan, Tarakay (Tchoka), the Kurile and the Aleutian isles, from south-west towards the north-east, (from 40° to 55° of latitude), how can it be believed that in so long a migration, on a way so easily intercepted, the remembrance of the institutions of the parent country could have been preserved with so much force and clearness! The cosmogonic fables, the pyramidal constructions, the system of the calendar, the animals of the tropics found in the catasterim of days, the convents and congregations of priests, the taste for statistic enumerations, the annals of the empire held in the most scrupulous order, lead us towards oriental Asia; while the lively remembrances of which we have just spoken, and the peculiar

physiognomy which Mexican civilization presents, in so many other respects, seem to indicate the antique existence of an empire in the north of America, between the 36° and 42° of latitude. We cannot reflect on the military monuments of the United States, without recollecting the first country of the civilized nations of Mexico. It is in rising to more general historical considerations, in examining with more care than has been hitherto done, the languages, and the osteologic conformation of different tribes, in exploring the immense country bounded by the Alleghanies, and the coast of the western ocean, that means will be obtained of throwing light upon a problem so worthy of exercising the sagacity of historians. In these researches there can be no question either respecting the first inhabitants of America (real history does not go back so far), or of a very advanced civilization, superior, for instance, to that of so many nations of Tartar or Mongul race in central Asia; nor, finally, respecting the fortuitous analogy of some sounds, some syllables that are again found, with significations altogether different, in the Tschoude, Indo-pelasgic, Iberian or Basque, and Welsh or Celtic tongues. (*Wilhelm von Humboldt, über die Urbewohner Hispaniens*, p. 95.) It is from vague and unphilosophical views that Indians have occasionally been believed to be discovered who speak Irish, Bas Breton, or the Celtic of Scotland. The fable of Welsh *Indians*, having preserved the Welsh, or Celtic language, is of very old date. In the time of Sir Walter Raleigh, a confused report was spread over England, that on the coast of Virginia the Welsh salutation had been heard; *hao, houi, iach.* Owen Chapelain relates, that in 1669, by pronouncing some Celtic words, he saved himself from the hands of the Indians of Tuscorora, by whom he was on the point of being *scalped!* The same thing, it is pretended, happened to Benjamin Beatty, in going from Virginia to Carolina. This Beatty asserts that he found a whole Welsh tribe, who preserved the tradition of the

voyage of Madoc-ap-Owen, which took place in 1170! John Filson, in his history of Kentucky, has revived these tales of the first travellers; according to him, Captain Abraham Chaplain saw Indians arrive at the post of Kaskasky, and converse in the Welsh language with some soldiers who were natives of Wales. He also believes, that "far off, to the west, on the banks of the Missouri, there exists a tribe which, besides the Celtic language, has also preserved some rites of the Christian religion." (*Hist. of Kent.* p. 122.) Captain Isaac Stewart asserts, that on the Red River of Natchitotches, at the distance of 700 miles above its mouth, in the Mississipi, near the confluence of the river of Post (?) he discovered Indians with a fair skin and red hair, who conversed in Welsh, and possessed the titles of their origin. "They produced, in proof of what they said of their arrival on the eastern coast, rolls of parchment carefully wrapt up in otter-skins, and on which great characters were written in blue, which neither Stewart, nor his fellow-traveller Davey, a native of Wales, could decypher." (*Mercure de France du 5 Nov.* 1785.) These are, no doubt, the Welsh books recently mentioned again in the French journals. (*Revue encyclopédique*, No. 4, p. 162; and article *Homme* in the *Dict. des sciences nat.*, Vol. xxi, p. 392.) We may observe first, that all these testimonies are extremely vague for the indication of places. The last letter of Mr. Owen, repeated in the journals of Europe (of the 11th February, 1819), places the posts of the Welsh Indians on the Madwaga, and divides them into two tribes, the Brydones and the Chadogians. "They speak Welsh with greater purity than it is spoken in the principality of Wales (!) since it is exempt from anglicisms; they profess Christianity strongly mixed with Druidism." We cannot read such assertions without recollecting that all those fabulous stories which flatter the imagination are renewed periodically under new forms. The learned and judicious geographer of the United States, Mr.

Warden, enquires justly, why all the traces of Welsh colonies and the Celtic tongue, have disappeared since less credulous travellers, and who in some sort controul one another, have visited the country situated between the Ohio and the Rocky Mountains. Mackenzie, Barton, Clark, Lewis, Pike, Drake, Mitchill, and the editors of the new *Archæologia Americana*, have found nothing, absolutely nothing, which denotes the remains of European colonies of the 12th century. The voyage also of Madoc-ap-Owen is much more uncertain than the expeditions of the Scandinavians (the Islandais Rauda, Biorn, Leif, &c.) If we were to find the vestiges of any European language in the north of America, it would be rather Teutonic, (Scandinavian, German, or Gothic), than the Celtic or Welsh, which differ essentially from the Germanic tongues. As the structure of the American idioms appears singularly strange to the different nations who speak the modern western languages, theologians have fancied they saw in it Hebrew (Semitic or Arameen); the Spanish colonists, Basque, (or Iberian); the English and French planters, Welsh, Irish, and Bas-breton. The pretensions of the Basques, and the inhabitants of Wales, who regard their languages not only as mother-tongues, but as the sources of all other tongues, extend far beyond America, to the Isles of the South Sea. I met with two officers of the Spanish and English navy, on the coast of Peru, one of whom pretended that he had heard the Basque at Tabiti, and the other Irish-Gaelic at the Sandwich islands. See above, Vol. iii, 265; and *Wilhelm von Humboldt, über die Urbew. Hispaniens*, p. 174—177). I thought it my duty to state with frankness my doubts of the existence of *Celto-Americans*. I shall change my opinion only when I am furnished with convincing proofs of the fact.

According to the traditions collected by Mr. Heckwelder, the country east of the Mississipi (*Nemæsi-Sipu*, Fish-river, *Mæsisip* by corruption), was heretofore inhabited by a pow-

erful nation, of gigantic stature, called *Tallegewi, Talligeu*, or *Alligheui*, and which gave its name to the *Alleghanian* mountains (*Alligheuian*). The Alligheuis were more civilized than any of the other tribes found in the northern climates by the Europeans of the 16th century. They inhabited towns founded on the banks of the Mississipi; and the fortifications which now excite the astonishment of travellers were constructed by them in order to defend themselves against the Lenni-Lenapes (Delawares), who came from the west, and were allied at that period with the Mengwis (Iroquois). It may be supposed that this invasion of a barbarous people changed the political and moral state of those countries. The Alleghewis were vanquished by the Lenni-Lenapes, after a long struggle. In their flight towards the south, they gathered together the bones of their *relations* in separate *tumuli*; they descended the Mississipi, and what became of them is not known." (*Trans. of the Historical Committee of the Amer. Philos. Society*, Vol. i, p. 30.) The first traditions of men are attached arbitrarily enough to such and such localities, because every nation is interested in its own vicinity; but the lines of fortifications of a prodigious length, observed by Captain Lewis on the banks of the Missouri, opposite the Isle of Bonhomme, (*Travels*, p. 48) and on the river Plata, sufficiently prove that the ancient habitation of the Allighewis, that powerful people which I am inclined to regard as being of Tolteque or Azteque race, extended far to the west of the Mississipi, towards the foot of the Rocky Mountains. M. Nuttal, in going up the Arkansa to Cadron, was informed of the existence of an ancient entrenchment, resembling a triangular fort. The Arkansas assert that it is the work of a *white* and civilized people, whom, when they arrived in this country, their ancestors fought, and vanquished, not by force but cunning. They attribute also to a more ancient and polished people than themselves, the monuments of rough stones heaped up on the summit of the

hills. Other monuments not less curious, are the commodious roads of immense length, which the natives have traced from time immemorial, and which lead from the banks of the Arkansa, near Littlerock, to Saint-Louis on the right, and by the settlement of Mont Prairie as far as Nachitoches, on the left. (*Journal of Travels in the Arkansa territory*, 1821, p. 28.)

Do the characteristic features of colossal stature, and *white* colour, attributed to nations now destroyed, owe their origin to the ideas of power and physical force in general, to the feeling of the intellectual preponderance of the Europeans, or are those features linked with the fables of white men, legislators, and priests, which we find among the Mexicans, the inhabitants of New-Grenada, and so many other American nations? The skeletons contained in the *tumuli*, of the trans-alleghanian country, belong, for the most part, to a stunted race of men, of lower stature than the Indians of Canada and the Missouri. (*Archæologia Americana*, Vol. i, p. 209.) The bodies found on the banks of the Merrimack, have even renewed in some authors, the fable of the pygmies. (*Morse, Modern Geography*, 1822, p. 211.)

An idol discovered at Natchez (*Archæol.* Vol. i, p. 215. *Annales des Voyages*, Vol. xix, p. 45, 428), has been justly compared by M. Malte-Brun, to the images of *celestial spirits*, found by Pallas among the Mongul nations. If the tribes who inhabit the towns on the banks of the Mississipi, issued from the same country of Aztlan, it must be admitted that the Tolteques, the Chichimeques and the Azteques, from the inspection of their idols, and their essays in sculpture, were much less advanced in the arts than the Mexican tribes, who, without deviating towards the east, have followed the great path of the nations of the New World, directed from north to south, from the banks of the Gila towards the lake of Nicaragua. In the narrative of the voyage of Mr. Eversman to Bokhara, we find a striking description of a mountain made

by the hands of man (*cerro hecho a mano*), half a league in circumference, situated in the middle of the town, and serving for the base of the palace of the Chan. This artificial hill, called *Aerk*, rises in the middle of a plain, and strikes the eye of the traveller from afar; it is decorated with bricks and clay. I have often in my works dwelt on the analogy between the Mexican *teocallis*, and the pyramid of Belus, and other edifices with stories or steps, of western Asia. We find in the *Aerk* of the Chan of Bokhara, the same mixture of bricks and clay spread in layers, that characterizes the construction of the pyramid of Cholula.

It is probable enough that the invasion of the Lenni-Lenapes, and the destruction of the power of the Allighewis, were connected with the migration of the Caribs. Without warranting their northern origin, and their passage from Florida to the Lucayan islands, I shall collect at the end of this note, the result of my researches on that important association of nations, so long calumniated by travellers. The Caribs of the continent, whose country still extends from the coast of the province of Nueva-Barcelona (*Missiones de Piritu*), along the banks of the Carony, the Essequibo, the Cuyuni, and the Rio Branco, as far as the equator, call themselves *Carina*. The Ottomaques call them *Caripina*; the Maypures, *Caripuna*. This is nearly the word *Callipinam* (in confounding the *l* and *r*,) of the language of the women in the Carib Islands. (See above, Vol. iii, p. 284. *Gili*, Vol. i, p. xxxv; Vol. iii, p. 107.) The Caribs of the West Indies divide their nation into inhabitants of the isles, or *Oubao-bonon*, and inhabitants of the continent, or *Baloue-bonon*. (Ile. *oubao*; habitation, *icabanum*, or *icabatobon*; continent, *baloue*.) *Rochefort, Hist. des Antilles*, p. 325, 658. *Breton, Dict. Caribe*, p. 32. The following are the names of the islands in the Carib tongue: Antigua, *Ouala*; Saint Bartholomew, *Ouaralao*; Saint-Martin, *Oualachi*; Saint-Croix, *Amonhana*, *Ayay*, or *Hay-hay*; (*Petr. Mart. Ocean*,

p. 54); Anguilla, *Maliouana*; Domingo, *Ouaitouconbouli*; Barbadoes, *Ouahomoni*; Marigalante, *Aichi*; Saint-Christopher, *Liamaigana*; Guadaloupe, *Calancacura*, (of which Petrus Martyr Oc., *Lib.* ix, fol. 63, has made *Caraqueira)*; the Cape land only *Balaorcone*; the low-land only *Kaerebone*; Portorico, or San Juan, *Borriken* or *Oubouemoin*. I have collected these names because the knowledge of them becomes indispensable to those who would study the geography of America at the beginning of the 16th century. I shall add some other names of islands, which, however, are not Carib: Guadaloupe, *Guacana*. (*Gomara, Hist.* fol. xxiii); Saint Domingo, or Isla Española, *Haïti* and *Quizqueja*. The first of these names signifies, in the language of the country, asperity, or mountainous place; the second, *Great Land*. (*Gomara*, fol. xvi); Cuba or Fernandina; Jamaica, *Santiago*; Trinidad, *Cairi*. The appearance of the Caribs is every where the same. Laet described those of the banks of the Marwina (Marony), two hundred years ago, exactly as I found the Caribs of the Llanos of Cari. "Mares sunt procero et obeso corpore, capillis in orbem detonsis, instar coronæ sacerdotalis et cutem rubro colore tincti; velant pudenda panniculo quodam unum palmum lato et duos longo, cætera, nudi: fœminæ pusillo sunt corpore." (*Descript. of the West Indies*, p. 647. See also *Archæol. Americana*, Vol. i, p. 305—433.) The geographical denominations of *Caribana, Carini*, and *Cariari* merit some investigation. The gulph of Uraba, (gulph of canoes, for *uru* signifies canoe, *Petr. Mart.* p. 32 C.), into which the great Rio Atrato throws itself, (Rio San Juan or Rio Dabeiba), did not bear the name of the gulph of Darien in the 16th century. A province situated between the mouth of the Rio Sinu (Zenu), and that of the Atrato, was then called *Caribana*. Gomara (*Hist. de las Indias*, 1553, fol. 30) names the following places from east to west: "*Caribana, Zena, Carthagena, Zambu y Santa Marta.*" The cape that bounds the gulph of Darien

on the east, still bears the name of *Punta Caribana*, as I have already mentioned in the text. In speaking of Alonzo de Ojeda, Gomara says, " Salió a tierra en Caribana (solar de Cariben como algunos quieren) que esta a la entrada del golfo de Uraba. Del golfo de Uraba cuentan 70 leguas hasta Cartagena. Otro golfo esta en medio del Rio Zenù y Caribana de donde se nombran los Caribes." (*L. c.*, fol. ix et xxxi.) Further eastward, the Caramares Indians (Caramairi), inhabitants of the coast where the port of Carthagena is now situated, believed also that they were of Carib origin. (*Petr. Mart. Oc.* p. 26, *Her. Dec.* 1, p. 179.) Herera, generally very exact in his geographical information, calls a bay on the eastern coast of Veragua, *Caribaco*, a circumstance the more fitted to fix attention, as the nations termed Caribs of Uraba, placed their first dwellings beyond the Rio Darien or Atrato. " Decian los Indios de esta region que havia tido su naturaleça pasado el Gran Rio de Darien." (*Dec. I*, p. 202.) But the most ancient name of the bay of Caribaco, between Cartago and the Laguna Chiriqui, is Caravaro, or Corobaro. (*Gomara Hist.*, fol. viii. *Her. Descr.*, p. 29. *Læt*, p. 345.) There existed no doubt to the west, anthropophagic nations, who, as Christopher Columbus has said (in the *Lettera rarissima del 7 di Junio* 1503) " mangiavano uomini como noi mangiamo oltre animali." Cariari or Cariai, which I erroneously confounded (vol. v, p. 606) with Caribana, was situated at the south of cape Gracias a Dios and the isle of Quiribiri, probably near the mouth of the Rio San Juan, which is the *desaguadero* of the lake of Nicaragua, and one of the most important points for the projected communication between the two seas. It was at Cariai that Columbus, by an illusion of his ardent imagination, thought he heard mention made of China, (Catay), and the river Ganges. The inhabitants were not of Carib race, but very mild, and given to commerce. Columbus speaks ill of the women only of this country, whom he calls licentious en-

chantresses. "Quando aggionsi, (he writes to the king and queen of Castile,) incontinente mi mandarono due fanciulle ornate di richi vestimenti: la più di tempo non saria di età di anni undici, l'altra di sette; tutte due con tanta pratica con tante atti et tonto vedere che saria bastato, se fossero state puttane publiche vinti anni. Portovano con esse loro polvere di incantamenti e altre cose della loro arte." The admiral resisted all these arts of seduction, and hastened to send the young girls on shore. (*Lettera rar.*, p. 9. 25. *Petr. Martyr. Oc.*, p. 53. *A. Her. Dec. I*, p. 132.) The name of *Cariari* appears a second time in the north-east part of South America. Gomara, in describing the coast from west to east, adds, "De Sant Roman al golfo triste (entre Punta Tucacas et Portocabelo) ay 50 leguas en que cae Curiana (Coro el pais de los Curianas. *Per. Nar.* vol. iii. p. 526.) Del golfo triste al *golfo de Cariari* ai 100 leguas de costa, puesta en 10 grados y que tiene a puerto de Canafistola Chiribichi y Rio de Cumana, y punta de Araia." (*Hist. de las Indias*, fol. viii.) From this ancient *Portulan* it results, that, if the golfo di Cariari is not identical with the gulph of Cariaco, it is but at a small distance. Is this repetition of the same geographical denominations on the coast of Veragua, and that of Cumana, connected with the ancient migrations of the nations of Carib race? What I stated in the text, of the knowledge the Caribs of Uraba had of hieroglyphic paintings, is founded on the following passage: "'Legum peritus dictus Corrales, Dariensium (Futeracæ et Caribanæ) prætor urbanus, inquit se occurrisse cuidam fugitivo ex internis occidentalibus magnis terris qui ad regulum repertum a se profugerat. Is legentem cernens prætorem insilivit admirabundus atque per interpretis, qui reguli hospitis sui linguam callebant: en quid et vos libros habetis, en et vos characteris quibus absentes vos intelligat assequimini? Oravit una ut apertus sibi libellus ostenderetur, putans se literas patrias visurum. Dissimiles reperit eas esse." (*Petr. Mart. Oc.*, p. 65. *D.*)

Among the Caramares also, who call themselves of Carib race, we find some traces of foreign cultivation. "Architecti pererrantes a littore parumper in frusto candidi marmoris se incidisse dixerunt. Putant peregrinos ad eas terras venisse quondam qui marmora e montibus aliquando scinderent et putamina illa in plano reliquerint." In a country almost entirely destitute of historical traditions, we feel an interest in a period anterior to the barbarism in which the Europeans found the hot regions of America, on the east of the Andes. These nations of Cauchieto, near Coro or Curiana, of Caramairi (near Cathagena), Caribana and Cariari, were rich in gold that came from the inland mountains. A part of this gold was mixed with $\frac{1}{5}$ of silver. It was the electrum of the ancients, the native auriferous silver, or as the *Conquistadores*, called it, from a word of the language of Haiti, *guanin*. (*Petr. Mart. Oc.*, p. 22.) In this passage *quanini* or rather *nini*, for *qua* is a form affixed, is falsely translated by aurichalcum.) Herera, in his Decades, (i. p. 79), gives the name of *quanines* to all sorts of necklaces made of gold of mean alloy. (See the words of the Haitian tongue that have not been collected by Gili, vol. iii. p. 224, in *Petr. Mart.* p. 59, 61.) In my sketch of the Carib nations I have not spoken of this custom attributed to the men, of stretching themselves on a hammock, and undergoing a long fast, after the delivery of their wives. It appears that this strange practice belonged to a small number of Carib tribes, and was more common among the other nations of the Oroonoko and the Amazon. (*Garcia*, p. 172. *Southey*, vol. i. p. 642). This custom was found heretofore among the Iberians, the Corsicans, and the Tibareni. (*Apollon. Rhod. Argonaut., Lib.* 2, v. 1009-1014.) In several provinces also of the south of France, husbands *faisoient couvade* at the birth of a child. The tall stature of the Caribs of the continent sufficiently confirms their northern origin; the first travellers were struck by the extraordinary height of the na-

tives of Florida. Luis Velasquez de Aylion found in his expedition (1520), on the coast of Chicora and at the mouth of Rio Jordan (between Savannah and Charlestown, in south Carolina), a race of Indians as tall as the Caribs, but with long hair, "Por aqella casta arriba hombres hai mui altos y que parecian gigantes." (*Gomara*, fol. 22. *Herera, Dec.* ii, p. 259. *Læt.*, p. 96.) The travellers of the 16th century, who, like modern travellers, had the rage of explaining every thing, believed that the Indians of Chicora softened their bones by taking the juice of herbs, and lengthened their members by stretching them out from time to time. With respect to the Asiatic origin (Araméenne) of the Caribs, we shall only mention further the Phenician and Roman money, which it is asserted has been found in the United-States; it was pretended that this money was of the 3rd century, and had been discovered in a cavern near Nashville; but it is now known (*Archæologia*, vol. i. p. 119.) that they were buried there either to deceive, or accidentally, with English money, by European planters. The Carthaginian money of Louisiana is fit to be placed by the pretended inscriptions of Dighton, found in the bay of Naraugaset, and on which Count de Gébelin has founded such absurd hypotheses. (*View of the Cordilleras*, vol. i. p. 60.) Is it very certain that the fine shell, 9 inches long and 7 broad, discovered in a *tumulus* near Cincinnati, is identical with the Cassis cornutus of the archipelago of the Asiatic islands? (*Long's Exped.* vol. i. p. 64).

Note B.

In order to facilitate the comparison of the late political associations formed on the new continent, with the ancient states of Europe, I shall here give a sketch of the surfaces, and their population. The different countries are ranged according to their extent, which is the least variable statistical element. Every member has been the object of a particular discussion, and I have consulted every statistical work to which I could find access. When the estimates of the *area* differed considerably, I calculated anew the surfaces according to the best maps. The *area* of the Iberian peninsula, for instance, is estimated at 18,155 square leagues, and not, as M. Antillon asserts, at 18,443; Spain, which was heretofore believed to contain 16,097, or 15,863 square leagues, has only 15,005. (*Principios de Geografia*, p. 135. *Elementos de la Geogr. de Espana*, 1815, p. 141, 143.) For the *area* of Portugal (3,150 square leagues), I have followed the calculation of colonel Franzini, (*Balbi, Essai statist. sur le Portugal*, Tom. i. p. 67). The population in my sketch is chiefly applicable to the years 1820 and 1822. That of France is founded on the enumeration of 1820, published by M. Coquebert de Montbret, and comprehending the army. The population of England is conformable to the enumeration of 1821. (See *Rickman, Enumeration of Parish Registers*, 1823, p. 33 and 35). For the population, and the *area* of Egypt, I am indebted to the unpublished researches of M. Jomard.

COMPARISON OF THE GREAT POLITICAL DIVISIONS ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
America, from Cape Horn as far as the parallel of Melville's Sound, and Cape Barrow (comprehending the West Indies and Newfoundland)	1,186,930.
Population, 34,284,000. By the square marine league, 29.	
Russian empire	316,000
Population, 54 millions. By the square league, 87.	
(Half-surface of the Moon, 614,768 square leagues.)	
North America, from the south-east extremity of the Isthmus of Panama, to 68° of north lat. (the continental part only, without the West India islands	607,337
Population, 19,650,000. By the square league, 32.	
South America, on the south of the isthmus of Panama, without the West India islands.....	571,000
Population, 12,161,000. By the square league, 21.	
Asiatic Russia, taking Kara, and the mountains Oural and Jaik for the western boundary.....	465,600
Population, 2 millions. By the square league, 4.	
Chinese Empire, comprehending the new western possessions of Taschkent, Kokan, and Kogend	463,200
Population, 175 millions. By the square league, 377.	

COMPARISON OF THE GREAT POLITICAL DIVISIONS ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
SPANISH AMERICA, comprehending the islands Population, 16,785,000. By the square league, 45.	371,400
EUROPE, as far as the Oural. . . . . Population, 195 millions. By the square league, 639.	304,700
PORTUGUESE AMERICA, (Brazil) . . . . . Population, 4 millions. By the square league, 15.	257,000
ENGLISH POSSESSIONS IN NORTH AMERICA, of which the countries altogether savage, Labrador, and New North and South Wales) form ⅛ or 157,000 square marine leagues . . . Population, 62,000, without the independent Indians.	205,000
UNITED STATES, from the coast of the Atlantic to that of the Pacific Ocean. . . . . Population, 10,220,000. By the square league, 58.	174,300
EUROPEAN RUSSIA, as far as Oural, (comprehending Poland and Finland) . . . . . Population, 52 millions. By the square league, 345.	150,400
CHINA, properly so called . . . . . Population, 150 millions. By the square league, 1172.	128,000
BUENOS-AYRES . . . . . Population, 2,300,000. By the square league, 18.	126,800
INDIAN PENINSULA, (Hindostan). . . . . Of which British India (with the protected	109,200

COMPARISON OF THE GREAT POLITICAL DIVISIONS, ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
countries) 90,100 square leagues. Population, 73 millions. Independent India, 19,000 square leagues. Population, 28 millions.	
Total Population, 101 millions. By the square league, 925.	
UNITED STATES, west of the Mississipi	96,600
Population, 816,000; with the Indians, 376,000. By the square league, 4.	
NEW SPAIN WITH GUATIMALA.....	92,600
Population, 8,400,000. By the square league, 95.	
COLUMBIA, (ancient vice-royalty of New Grenada, with the Capitania-general of Caraccas)	92,000
Population, 2,785,000. By the square league, 30.	
UNITED STATES, east of the Mississipi	77,700
Population, 9,404,000. By the square league, 121.	
NEW GRENADA (with Quito)	58,250
Population, 2 millions. By the square league, 34.	
BRITISH EMPIRE IN INDIA	90,106
Population, 73 millions. By the square league, 810.	
a Possessions of the Company (the three Presidencies with the provinces newly conquered). *Area*, 49,200 square leagues. Population, 55½ millions. By the square league, 1128.	
c Countries placed under the protection of the Company (Nizam, Rajah of	

COMPARISON OF THE GREAT POLITICAL DIVISIONS, ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
Mysore, l'Oude, of Nagpoor, &c.) *Area*, 40,900. Population, 17½ millions. By the square league, 428.	
PERU ..... Population, 1,400,000. By the square league, 34.	41,400
SWEDEN AND NORWAY..... Population, 3,550,000. By the square league, 90.	39,100
VENEZUELA, (the ancient Capitania-general) ... Population, 785,000. By the square league, 23.	33,700
THE 15 ATLANTIC STATES OF THE UNITED STATES OF AMERICA ..... Between the extreme limits of Georgia and the Maine, consequently without the Floridas, but on both sides of the Alleghanies. Population, 7,421,000. By the square league, 240.	30,900
AUSTRIAN MONARCHY .... Population, 29 millions. By the square league, 1324.	21,900
GERMANY ..... Population, 30½ millions. By the square league, 1432.	21,300
IBERIAN PENINSULA (Spain and Portugal)..... Population, 14,619,000. By the square league, 805.	18,150
FRANCE WITH CORSICA ... . Population, 30,616,000. By the square league, 1790.	17,100

COMPARISON OF THE GREAT POLITICAL DIVISIONS, ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
SPAIN	15,000
Population, 11,446,000. By the square league, 763.	
CHILI	14,300
Population, 1,100,000. By the square league, 76.	
ITALY	10,240
Population, 20,160,000. By the square league, 1967.	
BRITISH ISLANDS	10,000
Population, 21,200,800. By the square league, 2120.	
α England with the principality of Wales. *Area*, 4840 square leagues. Population, 12,218,500. By the square league, 2524.	
ϛ Scotland with its Isles. *Area*, 2470 square leagues. Population, 2,135,300. By the square league, 864.	
γ Ireland. *Area*, 2690 square leagues. Population, 6,847,000. By the square league, 2545.	
PRUSSIAN MONARCHY	8,900
Population, 11,663,000. By the square league, 1311.	
ARCHIPELAGO OF THE WEST INDIES	8,300
Population, 2½ millions. By the square league, 301.	
STATE OF VIRGINIA	5,400
Population, 1,065,000. By the square league, 197.	
PROVINCE OF CARACCAS, (with Coro)	5,200

COMPARISON OF THE GREAT POLITICAL DIVISIONS, ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
Population, 420,000. By the square league, 40.	
ENGLAND	4,840
Population, 12,218,500. By the square league, 2524.	
STATE OF PENSYLVANIA	3,900
Population, 1,049,500. By the square league, 269.	
INTENDANCE OF MEXICO	3,800
Population, 1,770,000. By the square league, 465.	
PORTUGAL	3,150
Population, 3,173,000. By the square league, 1007.	
SWITZERLAND	1,330
Population, 1,940,000. By the square league, 1175.	
EGYPT	1,400
Comprehending under that name the country only that receives or has received the waters of the Nile. The space between the Red Sea and the Lybian Oasis, comprehends 11,000 square marine leagues, but $\frac{7}{8}$ form only a desart.	
Population, 2,489,000. By the square league, 1777 (in the cultivated part only).	
GALICIA	1,650
Population, 1,400,000. By the square league, 1053.	
KINGDOM OF ARAGON	1,230

COMPARISON OF THE GREAT POLITICAL DIVISIONS, ARRANGED ACCORDING TO THE ORDER OF THEIR RESPECTIVE EXTENT.	Square Marine Leagues, 20 to a degree.
Population, 660,000. By the square league, 537.	
HOLLAND (the ancient Republic)	900
Population, 2,100,000. By the square league, 1330.	
KINGDOM OF VALENCIA..... .	640
Population, 1,200,000. By the square league, 1874.	
DEPARTMENT OF THE CHARENTE...	136
Population, 347,000. By the square league, 1865.	
This department and that of the Meurthe, furnish at the same time the mean extent, and population of a department of France.	

The estimate of the whole *area* of America is founded on the following calculation; I found in tracing the triangles by maps on a great scale :—

		Sq. Leagues.
I. *South America*, without comprehending the Isthmus of Panama		571,290
Columbia (without Veragua, and without the Isthmus)	89,344	
Peru, Chili, and Buenos Ayres, together	182,430	
Brazil.....	256,990	
English, Dutch, and French Guyana	11,320	
Patagonian lands, south of the Rio Negro	31,206	
	571,290	

		Sq. Lea.
II.	Isthmus of Panama, and province of Veragua	2,600
III.	Guatimala and New Spain together	92,570
IV.	The almost desert country which is not comprehended in the territory hitherto claimed by the government of the United States, and that of New Spain, namely, 1° on the west of Rio del Norte, between New Mexico, Sonora, and New California, from 35° to 42° of north latitude, from the port of San Francisco as far as cape San Sebastian; a surface of 41,162 square leagues, washed by the Rio Colorado: 2° on the east of the Rio del Norte, between New Mexico, the intendancies of Durango, and San Luis Potosi, the territory of the Arkansas, and the state of Missouri; a surface of 20,320 square leagues	61,482
V.	Territory of the United States	174,300
VI.	The whole space between the northern boundary of the United-States, and the parallel of 68°, which passes, according to the recent discoveries of Captain Franklin, on the south of the Archipelago of the Duke of York, by the capes Mackenzie, Barrow and Croker. That immense territory comprehends the English possessions, Labrador, the country of the Chipeways and Russian America, (excluding Greenland, West Main, beyond the parallel of 68°, and Cumberland Island	276,385
VII.	Insulary America, according to the calcu-	

	Sq. Lea.
lations of M. Lindenau and the maps of the Deposito hidrografico of Madrid (*Zach's Monatl. Corresp.*, 1817. *Dec.*)	8,303
Total	1,186,930

It results from these statements:

	Sq. Mar. Lea.
North America, on the north of the south-east extremity of the isthmus of Panama, contains	607,387
Archipelago of the West Indies	8,303
Population, 2,473,000.	
South America, on the south of the south-east extremity of the Isthmus of Panama	571,290
Population, 12,161,000.	
	1,186,930

If we compare these numbers with those furnished by the most esteemed and recent statistical works, we shall find, in reducing the English miles and geographical leagues uniformly to square marine leagues, of 20 to a degree, the total *area* of America with Greenland, to be, according to Mr. Morse, (*A new system of Geography*, 1822, p. 51,) 1,184,800 square leagues; according to M. Balbi (*Compendio di Geografia universale*, 1819, p. 308), 1,327,000 square leagues, America, nearly as far as the parallel 68°, according to M. Hassel (*Gaspari, Hassel, und Cannabrich*, Vollst. Erdbeschreibung, 1822, B. 16), of 1,072,026 square leagues; namely:

	Sq. Lea.
North America	539,453
Insulary	8,018
South	524,555
	1,072,026

Mr. Hassel having published the detail of these calculations, it is easy to recognize the continental parts, which in his estimations differ considerably from mine, made with a more complete knowledge of the limits, and with maps rectified by a great number of astronomical observations. In North America, a space of 61,000 square leagues, between the parallels of 35° and 42°, has been forgotten in the account, as is not *hitherto* comprehended in the territory of Mexico and the United States. In South America, the *area* of Buenos Ayres, Peru, and Brazil have been estimated 32,000+3,000+77,000=112,000 square leagues too little; and the *area* of Columbia and Chili 58,000+5,000 = 63,000 too great. Mr. Hassel by applying these corrections, would find for North America, 601,000 square leagues; for South America, 573,000, and for the whole New Continent with the West Indies, nearly as I have done, 1,182,000 square leagues, 20 to a degree.

The division of the Spanish colonies, or to speak with more precision, of the countries inhabited and governed by the Spanish Americans, north and south of the equator, is as follows:

On the continent of North America, comprehending the Isthmus of Panama, square leagues:	95,170
Population, 8,480,000.	
In the Archipelago of the West Indies	4,430
Population, 800,000.	
On the continent of South America	271,780
Population, 7,505,000.	
	371,380

These three groups yield altogether, a population of 16,785,000. (*See* above, p. 127 and 142.)

The surface of Indostan, and its political divisions, have been calculated with the greatest care by M. Mathieu, and myself, from a map bearing the title; "*New improved map of India, 1822, by Allen, Kingsbury, and Parbury.*" We found 109,190 square marine leagues, or 1,307,180 square English miles, in assigning the following limits to the peninsula of India: the mouth of the Indus and its course as far as 35° 20′ of lat. at the N. W. of Cashemere; the chain of the Himalaya nearest the lake Manasorovar, to the river Tistah; the Borampouter at 90° of longitude; the sea of Bengal, south of the isle of Mascal, and east of the river Sankar. I am surprised that Mr. Hamilton marks for the whole peninsula 1,020,000 square English miles, or 85,120 square marine leagues, an estimation one fifth too little. The statements of Playfair, which I have followed in my work on Mexico, and of MM. Balbi, Tempelman, and Hassel, (162,827 square leagues, 25 to a degree; 62,500 square geographical leagues; 69,750 square geographical leagues; 73,460 square geographical leagues), approach nearly the result on which I have fixed.

The following are my partial statements according to Allen's map: 1st. English territory, the Presidencies, 49,224 square marine leagues; 2nd. the country in the dependancies of the Company (tributary, subsidiary, and protected states) Rajah of Mysore, 2,635 square leagues. The Nizam, 8,126; Rajah of Nagpoor, 5,931; Holkar, 1,992; Oude, 2,052; Gykwar, 3,418; Rajpoots, 9,482; Seiks, 1,300; chiefs of Buddelkund, 1,229; Bopaul, 494; Sitarra, 1,185; Travencore, 658; Sindia, 2,398; altogether 40,900 square leagues. 3rd. Independent states: Lahore and Seizo, 10,935. Sinde, 3,643; Nepal, 4,335; Goa, Pondicherry, Chandernagor, Mahé, Tranquebar, Palicote, &c., 153: together, 19,066 square leagues. Total, 109,190 square leagues.

The population of England, according to the enumeration of 1377, was 2,300,000. The city of London then contained only 35,000. (*Lowe, Present State of England*, Ap. p. 3). The following is, according to Mr. Cleveland, the increase of the population of Great Britain within twenty-years: in 1801, the population amounted to 10,942,642; in 1811, to 12,596,803; and in 1821, to 14,353,800. In estimating the population of the Russian empire with Poland, at 54 millions, I reckoned 2 millions for the Asiatic part only. Official statements (*Pétersbuger Zeitschrift*, June, 1823, p. 294), give 1,606,195 to Siberia; namely, Tobolski, 572,471; Tomsk, 340,000; Jeniseisk, 135,000; Irkutsk, 400,500; Jakutsk, 147,015; Ochotsk, 6,703, and Kamtschatka, 4,506; I add for the parts situated on the east of the Oural Mountains, that is, for $\frac{1}{4}$ of the government of Perm, $\frac{1}{7}$ of the government of Orembourg, and the Kirgises, 1,606,195 inhabitants; Siberia, properly so called, 450,000 inhabitants.

According to the great imperial geographical map of China, the number of *taxable* persons amounted in 1790, to 143 millions. M. de Klaproth, thinks that 700,000 may be added for the army, and the persons exempted from taxation; so that China, properly so called, probably contains 150 millions. For Tartary, 6 millions may be reckoned (with the exception of Thibet and Coréa.)

Note C.

Whatever relates to the remains of the native population having a great interest for the friends of humanity, I shall here mark: 1st, the state of the missions of the fathers of the *Observance of Saint Francis*, in the province of Barcelona, missions that are vulgarly called of Piritu, and dependant on the college of the *Purissima Concepcion de Propaganda Fide* at Nueva Barcelona; (*See* above, Vol. vi, p. 8, &c.) 2d. The

state of the missions of the Oroonoko, the Cassiquiare, the Rio Negro, and the Atabapo, in the province of Guyana, (Vol. iv, p: 457, &c.), alike governed by the *brothers of the Observance* of the college of Nueva Barcelona: 3d, the state of the missions of Carony, east of Angostura, in the province of Guyana, confided to the Catalonian Capuchins. (Vol. v, p. 76.)

1° *State of the Missions of Piritu in the province of Nueva Barcelona in* 1799.

Names of 38 Villages served by Observantin Monks. Among that number 17 are of *mission*, and 21 of *doctrine*.	Population. Married.	Not married, grown up.	Children.	Period of the foundation.	Baptisms.	Deaths	Marriages.
La Purisa. Concepcion de Piritu. (D.)	366	259	660	1575	120	64	27
S. Antonio de Clarines. (D.)	422	776	458	1667	115	93	25
Nuestra Senora del Pilar. (D.)	558	542	1019	1674	204	108	46
Santa Catharina de Sena del Carito. (D.)	200	220	241	1798			
Jesus Maria Josef de Caigua. (D.)	526	775	547	1667	118	50	34
San Miguel	260	391	360	1661	60	42	19
N. S. P. S. Juan de Huere. (D.)	152	193	112	1675	57	30	16
San Pablo Apost. de Huere. (D.)	204	306	438	1680	101	68	21
San Lorenzo de Huere. (D.)	307	504	645	1675	61	30	10
S. Andres Apollin. de Onoto. (D.)	46	56	102	1687	28	9	8
Nuestra Senora del Amparo de Pozuelos. (D.)	53	85	82	1687	17	4	4
San Diego. (D.)	58	42	95	1688	23	11	5
Santo Domingo de Guzman de Araguita. (D.)	41	88	58	1690	16	10	4
San Juan Capistrano de Purney. (D.)	133	264	200	1680	40	22	10
San Bernardino. (D.)	252	254	296	1675	72	55	9
S. Josef de Curataquiche. (D.)	172	185	196	1679	47	28	12
S. Matheo Ap. y Evangelista. (D.)	308	309	545	1715	84	60	20
S. Vicente Ferrer de Carapa. (M.)	143	71	341	1793	34	20	13
Santa Gertrudis del Tigre. (M.)	70	74	105	1794	44	27	8
Nuestra Senora del Socorro del Cari. (M.)	134	198	188	1761	33	8	11
La Purisa. Concepcion de Tavaro. (M.)	98	113	143	1771	31	10	6
S. Pedro Apollin. de la Puerta. (D.)	128	175	195	1794	14	4	8
La Divina Pastora de Guaicupa. (M.)	51	42	86	1754	28	8	7
Santiago, o Santa Cruz de Orinoco. (D.)	50	25	97	1796	28	8	10
San Juan Baut. de Mucuras. (M.)	43	44	66	1754	33	11	10
La Anuncion de Atapiriri. (M.)	71	54	86	1754	24	6	4
S. Simon Apollin. de Moquete. (D.)	31	28	69	1799			
Santa Maria de Arivi. (M.)	72	91	76	1755	24	14	9
S. Pedro de Regalado de la Candelaria. (M.)	33	25	50	1755	17	8	5
S. Luis Chispo de Arivi. (M.)	41	89	95	1755	12	7	8
Santo Chiunto de Pariaguan (M.)	142	190	286	1744	51	4	11
Santa Cruz de Cachipo. (M.)	109	164	252	1749	54	14	7
Santa Ana de Chocopiche. (M.)	243	368	422	1735	66	13	18
S. Joaquin del Curire. (M.)	284	380	423	1724	63	20	15
N. Senora de la Candelaria de Chamariapa. (D.)	181	126	351	1742	47	12	9
Santa Rosa de Viterbo de Ocopi. (M.)	417	411	261	1724	104	47	23
N. Senora de Dolsnes de Quismare. (M.)	63	107	114	1748	20	14	8
S. Buenaventura de la Margarita (M.)	105	188	264	1721	44	22	10
	6679	8180	10,019	71	1934	961	468
		24,778					

This state of the population of 1799, was communicated to me, at Nueva Barcelona, by the president of the missions of Piritu. Among 24,778 inhabitants there are only about 1,500 whites (*Espanoles*) and mulattoes: all the rest of the population is of pure Indian race. An enumeration of 1792, believed to be more exact, yielded in 16 *pueblos de mission*:

	Souls.
2,196 Indian families, or	8,284
247 whites, and free mulatto families, or ...	1,351
Dispersos (insulated without the villages)	2,543
	12,178

In 16 *pueblos* of *doctrina*:

4,944 Indian families, or	17,967
51 white and mulatto families, or.....	246
Dispersos	40
	18,253

Consequently, in all the villages subject to the government of the Observantin monks in the province of Nueva Barcelona:

Indians	26,251
Españoles	1,597
Dispersos.....	2,583
Total	30,431

Must we conclude from the comparison of the states of 1792, and 1799, that the Indian population of the province has diminished, or does not the difference proceed from the negligence of the last enumeration and the exclusion of the *dispersos*?

2°. *State of the Missions of the Oroonoko, the Cassiquiare and the Rio Negro, in the province of Spanish Guyana, in 1796.*

San Felipe.....	52

	Souls.
San Miguel	102
San Baltasar	80
Esmeralda	92
Santa Barbara	94
San Fernando	226
Maypures	48
Carichana	100
Caño de Tortuga	117
Uruana	505
Encaramada	412
Cuchivero	329
Ciudad Real	403
Guaciparo	98
Uruana	100
Guaraguarayco	132
Aripao	84
San Pedro Alcantara	226
La Piedra	163
Platanar	356
Real Corona	609
Tapaquire	429
Borbon	342
Cerro del Morro	150
Orocopiche	558
Buenavista	230
Atures	47
San Carlos	272
San Francisco Solano	442
Tomo	155
Tuamini	119
Quirabuena	60
Maroa	79
Vaciva	87
Total	7298

3° *Missions of Carony in Spanish Guyana, in* 1797.

	Souls.
Cupapui	872
Santa Rosa de Cura	925
Santa Clara de Yaruapana	228
Aycaba	178
San Pedro de las Bocas de Paragua	550
Santa Magdalena de Currucay	200
San Serafin de Abaratayme	273
Miamo	287
Cumamo	512
Villa del Barceloneta	414
Pueblo de los Dolores de Maria	301
Nestra Señora del Ros. de Guatipati	732
San Josef de Ayma	630
San Juan Baptista de Avechica	514
Santa Cruz del Monte Calvario	429
Santa Ana de Purisa	504
Nestra Señora de los Angeles	541
San Buenavetura de Guri	663
Divina Pastora	498
Tupuqueri	566
Palmar	698
San Antonio de Usiatano	684
San Fidel del Carapo	753
Santa Eulalia de Murucuri	613
Pueblo del San Francisco del Alta Gracia	951
Nuestra Señora de Belin de Tumeremo	333
Caruache	400
Upata	667
San Miguel de Unala	487
Carony	699
Total	16,102

I composed, during my navigation on the Apure, the Oroonoko, the Atabapo, the Rio Negro, and the Cassiquiare,

with the aid of the missionaries, a sketch of the native tribes, who now inhabit the forests and savannahs comprehended between those rivers, and between the Caura, the Ventuari, and the Carony, on a surface of more than 19,000 square marine leagues. This geographical distribution is not without interest for the history of nations. I attempted at first to arrange the names according to the analogy of the languages, and the hypothesis which the missionaries, the sole historians of those countries, have formed on the filiation of the Indian tribes; but I was compelled to abandon that project, because more than $\frac{7}{8}$ would have remained what the classificating botanists call *incertæ sedis*. A traveller cannot offer finished labors; but what the reader has a right to require of him, is to present candidly such materials as he collected on the spot. Those which I here mark are disposed alphabetically, a pretty certain means of preserving them from ethnographic hypotheses, and of facilitating researches. Experience having proved to me that nations whose names appear almost identic, are sometimes of different race, I have, notwithstanding the fear of repetition, not joined arbitrarily the tribes that present those analogies of denomination. Father Caulin did not penetrate beyond the cataracts; I have, however, made use of his work whenever the conformity of the orthography of names gave me confidence in the identity of the tribes he mentions, with those contained in my own list. A manuscript catalogue (*Catalogo de lenguas y naciones del Rio-Orinoco*), kindly communicated to me by father Ramon Bueno, during my stay in the mission of Uruana, I found highly useful. I shall also cite in this sketch the pages of the *Personal Narrative*, which furnish the most ample information on the tribes now believed to be the most numerous, and important. I know that those tribes often take their denomination from words: *men, son of such or such a chief* (vol. v, p. 182); *descendant of such or such a courageous animal*; there is always, however, in the

simple names of nations something monumental, which, as the learned researches of MM. Abel Remusat, Wilhelm de Humboldt, Klaproth, Marsden, Ritter, and Vater, have proved, may become of high importance to the history of distant migrations. The analogy of roots, and etymological artifices have, no doubt, given rise for ages to absurd reveries, and historical romances. We shall not recognize the Quaquas of New Andalusia, in a tribe of that name who dwell on the coast of Guinea; or the Caraccas Indians, of Carib race, inhabiting the high vallies, in the name of an Iberian spot, cited by Ptolemy (*Geogr.* ii, 6, p. 46), and which appears connected with the *Basque* root, *car*, signifying height, summit, or elevation. (*Wilhelm von Humboldt, Urbewohner Hispaniens*, p. 68). The mutability of vowels, and the permutation of consonants, which take place in consequence of organic laws, produce, without counting the words that have imitative sounds (onomatopœia), fortuitous resemblances in thousands of tongues and dialects, of which the number might be submitted to the calculation of probabilities. If we compare one single language, not to those from one root, for instance, a semitic root, (Indo-Germanic or Welsh (Celtic), but to the whole mass of known idioms, the chance of those accidental analogies becomes the greatest possible, and from that appearance, the prodigious variety of languages of the two hemispheres seem linked together, *nexu reteformi*. Analogies of sound cannot always be considered as being analogies of roots; and although the learned who study these analogies, have a claim to encouragement and gratitude, in thus awakening the attention of linguists, it is not less true that the study of words should always be accompanied by that of the structure of languages, and a complete knowledge of grammatical forms. It were to be ignorant of the state of modern philosophy, not to recognize the eminent services which the etymological researches of a small number of men of solid erudition have rendered within

half a century, to the philosophical study of languages, in Holland, Germany, England, and France.

Tribes of the Oroonoko, of its branches, and its tributary streams.

A.

Arinacotos (Caura; Carapo, tributary stream of the Caroni, Rio de Aguas Blancas or Rio Parime; R. Paragua; Berbice).
Achaguas (Meta and Cravo, tributary of the Meta; Lower Apure).
Achirigotos (Erevato, Paragua).
Arivacos (Upper Caura).
Abanis (Oroonoko, usually Atures, Amanaveni).
Aruros (Oroonoko, east of Maypures, Amanaveni, Atures).
Arevirianas (Ventuari, Manapiare, Erevato).
Ajures (Ventuario, R. Paro).
Aguaricotos (Rio Caura, near the rapids of Mura).
Amarizanos (Meta).
Acarianas (Puruname; Jao).
Aberianas (Ventuari; Jao, sources of the Puruname).
Amuisanas or Amozana (Cassiquiare and Rio Parime).
Atures (sources of the Oroonoko; Raudal Mapara). Vol. v, p. 13, 144, 620.
Arinavis (R. Negro, Itinivini).
Aviras (Caura).
Arnacotos (Erevato).
Abacarvas (sources of the Rio de Aguas Blancas or Rio Parime).
Aruacas (Cujuni).
Aturayos (Esquibo).
Aturayes (R. Esquibo).
Acurias (Berbice).
Abacarva (Upper Paragua).
Ariguas (Caura).
Arevidianos (R. Parime).
Atapeimas (Upper Oroonoko).
Amarucatos (R. Parime).
Avanas (Rio Auvana).
Aquerecotos (a nation almost extinct).

B.

Berepaquinavis (Rio Negro, Itinivini).
Barinagotos (R. Paragua, tributary of the Caroni).

C.

Chorotas (Meta).
Cuyabas (between the Caroni and the Cuyuni).
Chavinavi (Carib-tribe).

Chapoanas (R. Negro).
Caduvini (Esquibo).
Cachirigotos (R. Parime).
Chinatos (R. Parime).
Chirapas (Auvana).
Cabres, Caberres (Guaviare, Ariari, Atabapo, some at Cuchiverò). Vol. v, p. 151, 205, 209, 424.
Chuenas (Cusiana, tributary of the Meta).
Caridaquères.
Chaipos.
Candalos.
Caparaches.
Cataras (Meta).
Curacicanas (Ventuari, and its tributary Manipiare). Vol. v, p. 605.
Cheruvichahena (Rio Negro, Rio Tomo).
Carives, Caribes, Cariua, Callinago (Paragua, Upper Caura). Vol. iii, p. 284; Vol. iv, p. 193, 465, 515; Vol. v, p. 204, 209, 360, 424; Vol. vi, p. 17.
Carianas (Paragua; Ucamu).
Cadupinapos (Upper Caura, Erevato).
Chiricoas (between the Meta and the Apure).
Civitenes (Ventuario, Rio Paro).
Carinacos (Upper Oroonoko, Rio Negro, Macoma; Ventuari Padamo).
Cogenas (R. Negro).
Cariguanas (R. de Aguas Blancas).

D.

Deesanas (Cassiquiare).
Darivasanas (Upper Oroonoko).
Davinavi (Ucamu).
Daricavanas (sources of the Rio Negro).

E.

Equinabis or Marivitanos (Upper Rio Negro between the Rio Temi and Azacami).
Emaructos (Upper Oroonoko).

G.

Gujancamos or Guayanicomos (Caura).
Guainares (sources of the Matacona). Vol. v, p. 565.
Guaycas (sources of the Oroonoko, Cano, Chiguire). Vol. v, p. 565, 760.
Guaraunos (mouth of the Oroonoko.) Vol. iii, p. 216, 277; Vol. v, p. 729.
Guaripacos (Upper Caura).
Guaypunabis (Inirida). Vol. v, p. 205. (Serrania Mabicóri and Cano Nooquene). Vol.

iv, p. 521; Vol. v, p. 204, 209, 425, 489.

Guanimanase (Rio Negro).

Guamos (Lower Apure). Vol. iv, p. 534; Vol. v, p. 565, 639.

Guaiquiris (sources of the Rio Caripo).

Guasurionnes (southern bank of the Upper Rio Negro).

Guapes (Rio Negro).

Guacavayos (Esquibo).

Guajamura (R. de Aguas Blancas).

Guinaves (Upper Oroonoko).

Guahibos (Meta). Vol. iv, p. 569; Vol. v, p. 9, 151, 234, 644.

Guayres (Upper Oroonoko).

Guabaribos (Upper Oroonoko). Vol. v, p. 563.

Guarares (R. Parime).

Guayumoros (Upper Oroonoko).

Guaranaos (R. Parime).

Gajones (Upper Oroonoko).

Guaneros (Padamo).

Guacamayas (Padamo).

Guaiquiris? perhaps heretofore between the Caura, et the Cuchivero. Vol. iii, p. 215 and 281, note ‡.

J.

Jaditanas (Erevato).

Juaos (Caura).

Jabacuyanas (Upper Oroonoko; Conoconumo, Jao).

Jayres (Upper Oroonoko) Rio Conoconumo; Jao).

Javarannas (Ventuari, Maniapire).

Jayures (Jao, Conoconumo).

Jaruros (between the Meta and the Apure, between the Ventuari and the Jao.) Vol. iv, p. 417, 563; Vol. v, p. 9.

Jcanicaros (Upper Oroonoko).

Jchapaminaris (Padomo).

Jpurucotos (Paragua). Vol. v, p. 838.

K.

Kiriquiripas (Paragua, Erevato).

Kirikiriscotos (Berbice).

L. and M.

Libirianos (Ventuario, Rio Paro).

Maypures heretofore (Raudal Quittuna; between the R. Sipapo and R. Capuana; Jao; Rio Negro et Patavita.)

Maciniravi (Caura).

Macurotos (Crevato, Upper Caura).

Manetibitanas (R. Siapa).

Marebitanas (R. Negro).

Mayepien (R. Negro).

Mayanaos (sources of the Esquibo).
Maconas (Padamo).
Macusis (R. Aguas Blancas, Esquibo).
Maysanas (Cassiquiare).
Mapojos (Caura).
Macos-Piraoas (Cataniapo). Vol. v, p. 124, 152.
Macos (Caura, Ventuari, Parueni, Paragua). Vol. v, p. 605.
Macos-Macos (sources of the Oroonoko).
Maquiritares (between the Jao and the Padamo; Ventuari). Vol. v, p. 505, 566.
Manivas (Rio Negro, Aquio).
Mariusas (mouth of the Oroonoko).
Maguisas (Upper-Caura).
Meyepures (Oroonoko, Amanaveni, Ventuari, Caura, Guanami).
Morononis (Jao, Ventuari).
Maripizanas (Cassiquiare, R. Guapo, R. Negro). Vol. v, p. 206.
Mariquiaitares (Padamo).
Matomatos (sources of the Oroonoko).
Manisipitanas (R. Negro).
Marivisanas (Ventuari).
Mapanavis (Ventuari).
Motilones (Caura).
Maymones (U. Oroonoko).
Massarinavi (Ventuari).
Marivitanos (Rio Negro). Vol. v, p. 206, 208.
Maisanas (Cassiquiare).

O.

Otomacos (between the Meta and the Apure). Vol. v, p. 515, 563, 568, 639, 669.
Ocomesianas (R. Guanami, western bank of the Jao).
Ojes (Cuchivero).

P.

Paraguanas (source of the Esquibo).
Piriquitos (R. Parime).
Panivas (Padamo).
Pujuni (Caura).
Puinabis (Guaviare).
Poimisanos (between Atabapo, Inirida et Guaviare).
Paragini (Ventuari).
Purucotos (Cara).
Parabenas (Caura).
Poignaves, or Puinabis (Inirida). Vol. v, p. 149, 566.
Paracaruscotos (Paragua).
Puinaves (Ventuari). Vol. v, p. 204.
Purugotos (Upper Caura, Paragua).
Paudacotos (Upper Caura).
Paravenes (Erevato).

Parenas (Oroonoko, Mataveni, Ventuari). Vol. v, p. 145.
Pottuari (Venituari).
Parecas (Vichada, Venituari, between the Cuchivero and the Cano Tortuga.)
Puipuitrenes (Ventuario, Paro).
Purayanas (R. Aguas blancas, Caura.)
Parabenas (R. Aguas blancas, Caura).
Putchinirinavos (Upper Rio Negro. Vol. v, p. 247).
Pajacotos (Padamo).
Palenkes (Caura).
Paraivanas (Padamo).
Pajuros (Cuchivero).

Q.

Quriquiripos (Caura).
Quirupas (Oroonoko; usually Atures).
Quaquas (Cuchivero). Vol. iii, p. 282.
Quinarao (Upper Oroonoko).

S.

Salivas (S. Meta, Paute, between Vichada and Guaviare). Vol. iv, p. 545.
Saparas (Padamo).
Sercucumas (Erevato).
Sagidaqueres (Atabapo, Temi, Uua, tributary of Guaviare).

T.

Tabajaris (Caura).
Tacutacu.
Taparitas (between the Meta and Apure).
Tomuzas (Lower Oroonoko).
Tasumas (Aguas blancas Esquibo).
Tamianacos (south-east of the Encaramada). Vol. iii, p. 284; Vol. v, p. 595, 626.
Toazannas (Siapa).
Taparitas (Apure).
Tiau (nation extinct).
Tujazonas.
Tamanaques (south-east of the Encaramada). Vol. iii, p. 284; Vol. v, p. 595, 626.

U. V. et Z.

Ules.
Urumanavi (Upper Oroonoko).
Vaniva.
Varinagotos (Carony, Carapo.)
Voquiares, (nation almost extinct, Upper Oroonoko).
Viras (Caura).
Zaparas (Esquibo, Rio de Aguas blancas).

I have just given a list of more than 200 tribes spread over a space a little larger than France; these tribes believe themselves to be at least as foreign to each other as the English, the Danes, and the Germans. I compare expressly the nations of Europe that belong to the same root; for we have often observed in this work, how much, in the dispersion, I had almost said in the great shipwreck of the American nations, simple dialects have by degrees taken the appearance of languages essentially different. The state of the organs of the voice, the permutation of consonants, the carelessness of pronunciation, render it difficult to recognize the analogy of the roots. The researches of MM. Heckewelder and Duponceau, in North America, render it probable that the tongues scattered heretofore over more than 120,000 square leagues, between the Alleghanies and the Rocky Mountains, the lakes of Canada and the Caribbean sea, are reduced to a very small number of roots, of which the Lenni-Lenape (Delaware), the Iroquois, and the Floridian are the most important. It may be enquired, whether among the tribes of the Oroonoko of which we have given the nomenclature, and which, it is painful to relate, now comprehends perhaps not 80,000 individuals, there exist 8 to 10 languages different from each other, like the German, the Slavonian, the Basque, and the Welsh? This question can only be solved by the study of the printed grammars which we owe to the care of the missionaries. My brother M. William de Humboldt, the sole Helenist who has acquired a profound knowledge of the Sanscrit, the semitic tongues, and almost all the idioms of Europe, without excluding the Basque, the Welsh, and the Hungarian, has been employed for a great number of years on the whole of the languages of the new continent. He posesses more materials for this study than have hitherto been collected, and the work in which he will soon make known the tongues of the new continent, will spread a new light on that important branch of our knowledge.

I have often spoken in my voyage to the Oroonoko, of the influence produced by the immense savannahs of America (between the Apure, the Meta, and the Guaviare, and between the sources of the Essequebo, and the Rio Parime, or Rio Branco); on the manners and language of the natives. The Llanos excite and cherish the taste for a wandering life, even in a region of the world where there are no herds to give milk, and where the *Indios vagos y andantes* live only by hunting and fishing. The Llanos contribute also to generalize a small number of tongues, and spread them over a vast space. (Vol. iv, 445; Vol. v, 14, 605.) The greatest mass of the nations we have just named inhabit a country covered with forests and mountains, and in which there is no other path than the course of rivers. The difficulty of removing, and the obstacles which the force of the vegetation, and the depth of the rivers oppose to hunting and fishing, have led the savage to become an husbandman. It is on this mountainous region, between the Esmeralda, the sources of the Carony, the sources of the Apure, and that of the Atabapo, where man is insulated and immoveable, that the appearance of the greatest diversity of tongues has been produced. The degree of barbarism in which those wandering people, the Guamos, the Achaguas, and the Otomacks, were heretofore found, differs as much from that of the Macos, the Caracicanas, and the Maquiritares, who are fixed to the soil, and given to cultivation, as their stature, and the colour of their skin (Vol. v. 567). The nations of the Upper-Oroonoko inhabit plains covered with forests, in the midst of which rise lofty mountains, but they are not, properly speaking, a mountainous people. Here, as on the table-land of Asia, conquering hordes issued from the steppes in the vicinity of the mountains and forests. The warlike and wandering Caribs have long been the masters and the scourge of those countries which they pass through to seize upon slaves. In their struggle with the Cabres, they were

the predominant nation of the Lower Oroonoko, as were the Guaypunabis, enemies of the Manitivitains, between the Atabapo, the Cassiquiare and the Rio Negro, (Vol. v. 204, 208). The idioms of conquering nations have been generalized, and have survived the national preponderance; where they have not been substituted altogether for the native languages, they have left insulated words on their passage, which have been mixed, incorporated, *agglomerated* to languages entirely different. Those words, recognized by the dissimilarity of the sounds, are in barbarous countries the sole monuments of the antique revolutions of the human race. They have often a singular form, and in a country destitute of traditions, present themselves to the imagination like the vestiges of the animals of the primitive world, and which buried in the earth, are in contrast with the forms of the animals of our days.

European civilization, like all foreign and *imported* civilization, ascends the rivers, which native civilization descends, as is proved by the history of the people of Indus, the Ganges, the Euphrates, perhaps even the Nile. It cannot be doubted that anterior the barbarous hordes which now inhabit the forests of Guyana, those countries were peopled by another race more advanced in civilization, and who had covered the rocks with symbolic traces. Those painted rocks form a particular zone between the Atabapo and the Cassiquiare, the sources of the Essequebo and the Rio Branco, the Uruana and Cabruta, where the Tamanaque traditions on the deluge of Amalivaca are connected with the sculptured figures in granite. (Vol. v. 600). In the torrid as well as in the temperate zone, on the east of the Andes, as on the east of the Rocky Mountains, in that long series of nations which have successively inundated the plains, a feeble gleam of civilization had preceded the barbarism that existed when the European colonists passed over the Alleghanies, and along the banks of the Lower Oroonoko. Walls of a pro-

digious length, constructed of stone or earth, in the United States, denote the existence of populous towns, or of fortified camps and places at the confluence of great rivers. Notwithstanding the illusions of Raleigh and Keymis, no traces have hitherto been discovered in Guyana of an edifice in stone. Had the nations of the Oroonoko remained abandoned to themselves, the civilization of Peru and the table-land of New Grenada, and that of the empires of the Inca and the Zaque would have penetrated towards the east, following the course of the Caqueta, the Rio Negro, and the Meta (Vol. v, 809, 838, 839); but this movement of native cultivation would have been slower than that of foreign.

I am not ignorant that languages which have no literature are pretty generally considered with disdain; (*inculti sermonis horrorem*) those sounds appear to us but the wild cry of nature, because our ear is not formed to seize the gradations; but we must not forget that there is another view in which languages should be studied than that of collecting the individualities of a foreign literature.

The most uncultivated tongues are interesting with respect to their structure and interior organization. The botanist scarcely gives any preference to the plants which can be employed usefully in the arts, or which augment national wealth; he seeks to analyse all the forms of the vegetable kingdom, because to apprehend properly the organization of one, he must know them all. In the same manner, we cannot reduce the tongues into families, without studying a great number of those that differ in their grammatical structure. If the multiplicity of languages existing on a small space, opposes great obstacles to the communication of different tribes, it gives them the advantage of preserving a character of individuality, without which all that belongs to national physiognomy is effaced. Besides, and I dwell with pleasure on this circumstance, none of the American tongues are in that

state of barbarism which has long been erroneously believed to characterize the infancy of nations; all have fixed grammatical forms, for the parts essentially organic in an idiom are formed at the same time. (William de Humboldt, on the progressive development of languages, in the *Memoirs de l'Académie Royale de Prusse*, 1823.) The further we penetrate into the structure of a great number of idioms, the more we distrust the great divisions of tongues (by bifurcation) into synthetic and analytic. These classes, somewhat like the great divisions of organized bodies, present a deceitful simplicity, to which the naturalist begins to substitute a distribution by small numerous groupes, connected as if interwoven together. To ask if this multiplicity of idioms is primitive, or the effect of progressive deviation, is to enquire if that variety of plants that embellish the earth has always existed, or if (according to the hypothesis of the great naturalist of Upsal) the species have been diversified by mutual fecundation. Questions of this kind do not belong to history, but to the cosmogonic fables of nations.

Note D.

The following are the very incomplete statements which have been hitherto obtained on the population of the ancient vice-royalty of Buenos Ayres, designated, under the government of the mother country, by the name of *Provincias del Rio de la Plata*, and divided into intendancies and governments, (Buenos Ayres, Montevideo, Paraguay, Salta del Tucuman,

Cordova del Tucuman, Charcas, La Paz, Potosi, Santa-Cruz de la Sierra, Chiquitos, and Moxos):

I. Audiencia de Buenos-Ayres.

Political divisions.

	Population, not comprehending the Indians.	Indians only.	Total Population.
Buenos Ayres	120,000	130,000	250,000
Cordova	75,000	25,000	100,000
Tucuman	60,000		
Salta (with the Vale de Catamarca and Jujuy)	60,000		
Cuyo (Mendoza and S. Juan de la Frontera)	75,000		
Paraguay and Missions...	140,000		
Santa Fe, between Rios and Banda Oriental ...	50,000		
Districts not estimated...	75,000		
Total.	655,000		

(*See Brackenridge, Voyage to South America*, 1820, vol. ii. p. 47. Mr. Rodney, by different calculations, finds either 489,000, or 523,000. *Message to the fifteenth Congress*, 1818, p. 54.)

II. Audiencia of Charcas.

Political divisions.

Intendance of Charcas.

Charcas (La Plata or Chuquisaca)	16,000		16,000
Zinti	25,000	35,000	60,000
Yamparaes	12,000	28,000	40,000
Tomina	12,000	28,000	40,000
Paria	13,000	37,000	50,000
Oruro	6,000	9,000	15,000
Carangas	8,000	17,000	25,000
	92,000	154,000	246,000

	Population, not comprehending the Indians.	Indians only.	Total Population.
Intendance of Potosi :			
Potosi	14,000	21,000	35,000
Atacama	8,000	22,000	30,000
Lipes	8,000	12,000	20,000
Porco	15,000	115,000	130,000
Chayanta	40,000	60,000	100,000
	85,000	230,000	315,000
Intendance of la Paz :			
La Paz	14,000	26,000	40,000
Pacajes	60,000	30,000	90,000
Sicasica.....	20,000	40,000	60,000
Chulumani	15,000	35,000	50,000
Omasuyos.....	30,000	30,000	60,000
Larecaja	25,000	40,000	65,000
Apolobamba.....	5,000	30,000	35,000
	169,000	231,000	400,000
Intendance of Cochabamba :			
Cochabamba.....	30,000	70,000	100,000
Sacaba	15,000	45,000	60,000
Tapacari	30,000	70,000	100,000
Arque	10,000	25,000	35,000
Palca.....	6,000	14,000	20,000
Clissa	35,000	66,000	100,000
Mizque	8,000	12,000	20,000
Valle Grande (Jesus de Montes Claros).....	3,000	70,000	100,000
	164,000	371,000	535,000
Santa-Cruz de la Sierra, Moxos et Chiquitos.....			220,000

(*Brackenridge*, vol. ii. p. 80.) I have rectified the names of the provinces.

Principal Towns, in the Audiencia of Buenos Ayres; Buenos Ayres 60,000; Montevideo 7000; San Miguel de Cordova 6000; Santa Fe 6000; Tucuman 6000; Salta 6000; Mendoza 8000; Asumpcion 12,000; La Candearia 5000. In the audiencia of Charcas: La Paz 40,000; Potosi 35,000; La Plata 16,000; Oruro 15,000; Zinti 12,000; Oropesa 25,000; Zarate 12,000.

These estimates of the population are incomplete for the lower regions of the Audiencia of Buenos Ayres; for instance, for Salta, Sante Fe, Banda oriental and Entre Rios, the calculation is perhaps too low; it amounts from the years 1817 to 1820, for the Audiencia of Charcas, with Santa Cruz, Moxos, and Chiquitos to 1,716,000, comprehending the natives; for the Audieneia of Buenos Ayres, *without the Indians*, 655,000, total 2,371,000. M. Schmidtmeyer, in his interesting *Voyage to Chili*, reckons 1,100,000 inhabitants for the basin of La Plata, and 1,300,000 for the *provincias de la Sierra*. It appears to me probable that before the revolution, the white, copper-coloured, and mixed population of the whole vice-royalty, previously to the dismembering of the Cisplatine province by the Brazilian Portuguese, and of Paraguay by Doctor Franzia, exceeded 2½ millions, of whom 1,200,000 were Indians.

Note E.

The rapid increase of the population of the United States has been the basis of so many calculations of political economy in Europe, that it becomes highly interesting to know with precision the principal statements. In order to compare the numbers, and fix them with exactness, we must have recourse to the first sources, that is, to the tables printed by the Congress, and cleared of the typographical errors by which they are sometimes disfigured. The population of 1800, which was 5,306,032, is stated by Mr. Mellish (*Travels*, p. 566), at 5,308,844; by Mr. Seybert (*Statist. Annals*, p. 72), at 5,319,762; by Mr. Harvey (*Edin. Phil. Journ.* 1823, p. 42), at 5,309,758. I shall here transcribe a note, which I owe to the kindness of M. Gallatin, who long occupied the place of minister of the public treasure at Washington, and whose departure from Europe has recently caused so much regret to those who know how to appreciate talents, and generous sentiments.

"The exactness of the following official information may be depended on:

	1790.	1800.	1810.	1820.	
Whites.....	3,172,120	4,303,138	5,862,093	7,862,282	Under the name of *blacks* is comprehended also the copper-coloured people, of which the number is very small in the United States.
Blacks { Free.	59,511	109,294	186,443	238,149	
Blacks { Slaves	697,697	893,605	1,191,367	1,537,568	
Total..	3,929,328	5,306,032	7,239,903	9,637,999	

"There are several observations to be made in calculating the increase for every period of ten years.

"1st. The inhabitants of the countries situated on the north of the Ohio, (States of the Ohio, Indiana, and the Illinois, and the territory of Michigan), and also the inhabitants of the territory forming at present the state of Mississipi, were not numbered in 1790, and they ought to be added to the enumeration of that year. I calculate that they were at that period:

Whites	10,000	11,800.
Free Blacks	200	
Slaves	1,600	

"2dly, Three counties of the state of Alabama have been omitted in the estimate of 1820, but it is known that they contained more than 12,000 inhabitants, of which nearly 8000 were whites, 4000 slaves, and 50 free blacks.

"3dly, Louisiana having been acquired only in 1803, could not be comprehended in the enumerations of 1790 and 1800. According to the enumerations made in 1799-1802 by the Spanish government, the population of Louisiana was in 1800;

	Lower Louisiana, at present *Louisiana.*	Arkansa.	Upper Louisiana, at present *Missouri.*	Total.	
Whites	18,850	350	5,000	24,200	This number must be added to the enumeration of 1800, when we calculate the increase from 1800 to 1810.
Blacks Free	2,300	—	200	2,500	
Blacks Slaves	18,850	50	9	19,800	
Total	40,000	400	6,100	46,500	

"4thly, In order to calculate the *actual* increase, we must include, not only the acquisition of Lousiana, but also the emigrations from Europe. With respect to the white population, we may, I think, assert, that the annual mean of the emigrants arriving in the United States is nearly 10,000, or rather between 7,000 and 14,000; for although there have been years of 22,000 and of 5,000, the average of the emigration from Europe is not above 14,000, nor below 7000. The increase of the black population is entirely natural, with the exception of the period from 1800 to 1810, during which we must include, not only the number of blacks found in Louisiana, but also nearly 39,000 Africans, imported during the years 1804 to 1807, the period to which South Carolina permitted the importation of slaves. We should always consider in these calculations the whole of the black population, free and enslaved.

"Although we have not yet sufficient statements to obtain definitive results on the annual births and deaths, it may be affirmed that for the white population, the former are below five, and the latter below two, in an hundred. The natural annual difference or increase is 2·0 in an hundred."

I shall add to the above information given by Mr. Gallatin, some other numerical statements:

The *total population* in 1810, was 7,239,903; in 1820 it was 9,637,999; increase 33 p. cent.

The *white population*, in 1810, was 5,862,093; in 1820 it was 7,856,082; increase 34 p. cent.

The *slave population*, in 1810, was 1,191,364; in 1820 it was 1,537,568; increase 28 p. cent.

The population of free coloured people, in 1810, was 186,443; in 1820 it was 238,149, increase of 27½ p. cent.

The calculation of the *area* of the United States, which I gave above, in Chapter xxvi, supposes the astronomical verification of five great lines; those of the coast of the

Atlantic, the Alleghany Mountains, the course of the Mississipi, the Rocky Mountains, and the coasts of the South Sea that divide the confederation into four natural sections. If the general maps that have hitherto been traced, had no other errors than those of *absolute* longitude, and in preserving the differences of *relative* longitude, they displaced equally with regard to Europe (for instance to the meridians of Paris or Greenwich), the five great lines we have just named, the *area* of the partial divisions would not be altered. In order to estimate the effects of these unequal displacings, I have compared on every map used for the calculation of surfaces, the longitude of New York, Pittsburg, the confluence of the Ohio and the Mississipi, and of Taos, a village of New Mexico, situated, so to speak, on the prolongation of the Rocky Mountains, and the bay of Nootka. The three first points are founded on the excellent observations of M. Ferrer. New York is 8° 22′ 34″ east of Morro of the Havannah, and this point being 84° 42′ 33″ by my observations of the satellites, and according to the occulations of M. Ferrer, 84° 42′ 43″ west of Paris, we may admit, for the absolute longitude of New York, 76° 20′ 9″. (*Conn. des temps*, 1817, p. 320 and 339; and my Astr. Obs. Vol. 2, p. 108). The well determined longitudes of Pittsburg (82° 18′ 30″), of Albany (76° 4′ 45″), and of Lancaster (78° 39′ 30″) serve, by the proximity of those three points to the mountains, to contain within just limits the chain of the Alleghanies. The line of the Mississipi is fixed by observations made at the mouth of the Ohio (91° 22′ 45″), and at New Orleans (92° 26′ 15″). The chain of the Rocky Mountains which divides the country west of the Mississipi into two great sections, is not yet so accurately determined as to its longitude as the three preceding lines. I suppose Taos of New Mexico at 106° 50′; Lewis and Clarke place the central chain of the mountains in the parallel 45°, at 114° 40′; but

this position is probably far too much to the west, although the parallel chains of the Rocky Mountains fill a space of more than 3° of longitude, in this parallel. The coast of the Pacific Ocean has been surveyed with the greatest care by Vancouver, Galiano, and Valdes; the *relative longitudes* leave little to desire, but the *absolute longitudes* remain in uncertainty more than half a degree. According to the learned researches of Mr. Oltmanns, the Nook of the Friends at the isle of Nootka is probably 128° 57′; but the partial results of Galiano (8^h 35′ 40″), Marchand (8^h 35′ 44″), Cook (8^h 36′ 10″) and of Vancouver (8^h 36′ 55′′), are not in the accordance we might have hoped from the concurrence of so many chronometers, and such a series of lunar distances. (*See my Obs. astron.* Tom. ii, p. 596, and *Oltmans, Geogr. Untersuchungen*, Tom. ii, p. 439).

The five great lines of demarcation which we have just discussed, divide the immense territory of the United States into four unequal parts:

α) *Between the Atlantic coast and the Alleghanies*, in supposing those mountains prolonged on the north; towards Plattsburg, and on the south, by following the banks of the Apalachicola. According to this prolongation, proposed by Mr. Gallatin in a very interesting memoir which he permitted me to insert in the Political Essay on New Spain, (Vol. iv. p. 324), the grestest part of Florida is comprehended in this first division, the *area* of which I found to be at least 324,000 square English miles, or 27,064 square marine leagues. I calculated separately the portion of the *Atlantic States* that falls on the west of the Alleghany Mountains, those mountains crossing the states of New York, Pensylvania, Virginia, and North Carolina. The extent of country which we must deduct from the total territory of the *Atlantic States*, comprehending West Florida, is 97,071 square miles. In dividing the 324,000 square miles of the first division in the

north-east States (from the Delawar to the Maine), and in the south-east states (from Maryland to Florida), we find for the former 110,991 square miles; and for the latter 213,009 square miles. The *Atlantic Slave-States* (states with slaves situated on the east of the Alleghanies) exceed a little the *area* of France. The whole of Florida contains, according to my calculations, 59,187 square miles, of which 52,310 are on the east of Apalachicola, and 6,877 on the west of that river. MM. Carcy and Lea estimate Florida at 57,750 square miles. The division of Alleghanies into several parallel chains renders the partition of the United States situated on the left bank of the Mississipi, a little arbitrary, in two portions, on the east and west of the mountains. The 15 *Atlantic States* (from Georgia to the Maine, consequently without the Floridas) occupy, on the two sides of the mountains, according to Mr. Warden, 386,000 square miles; according to Mr. Morse, 377,446, and according to M. Melish, 366,000. In adopting the latter number, and in estimating at 97,071 — 6,877 = 90,194 square miles, the 15 states lying on the west of the Alleghanies, we find the territory of the United States comprehended between the Atlantic Ocean and the mountains, without Florida, to be 275,806 square miles, and with Florida, 328,116; which results agree with those I found from direct measures. Mr. Gallatin, in 1804, estimated this division, without comprehending Florida, at 320,000 square miles, which seems to prove that this statesman, so well versed in the statistics of his country, had allowed more than 386,000 square miles, for the total *area* of the *Atlantic States*, or, that he had traced the line of division by a chain less easterly than the Alleghanies.

8) *Between the Alleghanies and the Mississipi*, at most 606,000 square English miles, or 50,620 square marine leagues. I find, without that part of Florida situated on the west of

Apalachicola, 599,123 square miles. Mr. Gallatin had well estimated that surface at more than 580,000 square miles. If the partial value of the two sections α and β are affected by the uncertainty of a line of demarcation passing by one of the numerous chains of the Alleghanies, the total value of $\alpha + \beta$ remains less doubtful, because it depends only on the position of the coast of the Atlantic, that of the lakes, and the course of the Mississipi. The divisions of the United States into two great sections, on the east and west of the Mississipi, is, from its very nature, the most exact of all; and the maps which we possess at present, disagree only on account of the uncertain form of the peninsula of Florida, and the want of an accurate representation of the coast of Georgia, of Alabama, and of the territory of the Mississipi. Mr. Gallatin finds for the value of $\alpha + \beta$, comprehending Florida, 958,000 square miles; Mr. Warden, 909,000; Mr. Melish, 952,000. I have fixed on 980,000 square miles, or 77,700 square marine leagues; but Mr. Brué's map, for which several astronomic positions were employed, gives 972,000 square miles. All these calculations of the *area* prove, that the limits of the errors are in the actual state of the geography of America, between one twenty-sixth and one thirty-fifth. The errors even in Europe amount in many countries, to one-fortieth. (*Antillon, Geogr. ph.* 143).

Between the Mississipi and the Rocky Mountains, 868,400 square miles, or 72,531 square leagues. As many doubts have been recently thrown out respecting the *area* of the territory of the Missouri, I have again made the calculation on a great number of maps; of which the result for the part of that territory between the Mississipi and the Rocky Mountains, comprehending the state of Missouri, is, 693,862; 680,806; 692,277; 696,277 square miles. Mr.

Morse estimates this *area* much too high at 860,000 square miles. The territory of the Arkansas only, of a great part of which Major Long has taken very exact surveys, is 125,855 square miles. I found the state of Louisiana on the east of the Mississipi, 6200 square miles, and on the west 45,300.

Between the Rocky Mountains and the coast of the Pacific Ocean: 288,400 square miles, or 24,091 square marine leagues. This is the territory of Columbia, of Oregon or the west, which must not be confounded either with the *territory of the north-west*, between lake Superiour and lake Michigan, now comprehended in the territory of Michigan, nor with the English western territory, which the members of the North West Company pass over. I have found on different maps, for this fourth great division of the United States, 286,034; 288,391; 284,925; and 290,400 square English miles. The territory of Oregon (Columbia), Arkansas, and Missouri, comprehending the state of this latter name, furnishes, according to my calculation, an *area* of 1,107,000 square miles, an immense region, which in 1820 did not contain 83,000 inhabitants of European origin.

The United States, from the Atlantic to the Pacific Ocean, now comprehend an *area* of 174,306 square leagues, 20 to a degree, or 2,086,800 square miles. Mr. Morse computes the *area* at 2 millions of square miles, the half of which belongs to the territory of Missouri, Arkansas, and Oregon. M. Warden, in the French and English editions of his statistical work (Introd. Vol. i, p. xlix and li,) had estimated that surface at more than 1,636,000 square miles; and if he seems at a later period in the French edition (Vol. v, p. 100, and *Bulletin de la Societé de Géographie*, vol. i, n° 3), to fix on 1,637,000, that diminution of surface arises only from an error caused by the reduction of leagues into square miles. The

territory comprehended between the Mississipi and the Pacific Ocean, does not contain 741,414 square miles (namely, the state of Louisiana, deducting what is eastward of the Mississipi, 48,200 — 9,215 = 39,005; territory of Arkansas, 76,961; territory of the Missouri, 445,334; territory of the West, 180,114 (*Warden*, Vol. i, p. 101; Vol. iv, p. 563, 653); but 1,156,800 square miles. A well-informed geographer, whom Mr. Warden had employed in those calculations of surface, repeated them at my desire; and, in employing the real logarithms of reduction, found the territory of Missouri, comprehending the state of that name, nearly as I did, to be 696,000 square miles, instead of 445,334; the territory of the West, 284,000 square miles, instead of 180,114; and the territory of Arkansas, 125,855 square miles, instead of 76,961. These partial errors, which bear only on the most unpeopled part of the American territory, and from which the calculations of surface in the English edition of Mr. Warden's work are entirely exempt, produce a total difference of more than 400,000 square miles, or 33,400 square marine leagues. M. Adrien Balbi, who in his statistical essay on the kingdom of Portugal has collected a great number of precious materials for the study of political economy in general, computes the *area* of the United States (Vol. i, p. 259,) to be 2,146,000 Italian square miles, 60 to a degree (238,000 square marine leagues). This estimate is nearly one-fifth too great. On the other hand, the results fixed on by Mr. Morse, in a very instructive work just published at Boston, with the title *System of Modern Geography*, differ very little from mine for the eastern part of the confederation. He fixes the United States at 377,446 square miles; now, deducting 90,200 for the portion of those states lying west of the Alleghanies, and adding 52,300 for Florida, on the east of Apalachicola, we obtain, for the division *a*, 339,600 square miles. The eight states and territories situated between the Atlantic States and the Mississipi, comprehending

the eastern part of the state of Louisiana, are computed by Mr. Morse at 484,000 square miles; and the whole division β (adding 90,200 + 6,900 for the portion of the *Atlantic States* and Florida, on the west of the Alleghanies), at 581,100 square miles. It thence results for α and β, 920,700 square miles, only one ninety-fifth less than the *area* which I stated (see above, p. 179,) for the territory of the United States east of the Mississipi.

A surface of 2,086,800 square miles furnished to the industry of a laborious people wisely governed, is ten times larger than France. It need not be augmented by substituting, as some American engineers have seemed recently to desire (on occasion of the rectification of the limits of Canada), *geocentric latitudes* (the angle formed by the inclination of the earth with the equator) for ordinary latitudes. (*Quart. Journ. of Sciences*, 1823, Jan., p. 412.)

In comparing the *area* of the great divisions with the number of inhabitants which the enumeration of 1820 yields, we find:

I. In the 15 Atlantic States (from Maine to Georgia), consequently without the Florida on both sides of the Alleghanies,

on 30,900 square marine leagues, or
370,000 square English miles

Absolute population 7,420,762

Relative population on the sq. mar. lea 239

II. Between the Atlantic States and the left bank of the Mississipi (also without Florida), on 42,000 square leagues,

Absolute population 1,982,998

Relative population on the sq. mar. lea 47

III. Between the right bank of the Mississipi and the coast of the Pacific Ocean, on 96,600 square leagues, or 1,156,000 square miles.

Absolute population, without the Indians 234,239

Relative population of the whites on the square league 2½

It results from these calculations, in which the errors in the estimate of surfaces can have no sensible influence on the relative population, that the United States on the east of the Mississipi (without comprehending the Floridas) contained in 1820, on an *area* of 77,700 square marine leagues, or 730,000 square English miles, an absolute population of 9,403,760, and a relative population of 122 inhabitants to the square marine league. If the relative population of the whole territory of the United States, from the Pacific to the Atlantic Ocean, was in 1820, 55 inhabitants to the square league, it must have been at the end of the year 1822, (when I find, in supposing an uniform increase, a total population of 10,220,800), a little above 68. The immense augmentation of the population on the east of the Mississipi becomes little sensible if, according to a simply mathematical abstraction, we divide the whole population over the entire surface of the territory.

I have discussed in this note the uncertainty that hangs over objects of the highest interest in political economy; I have particularly fixed my attention on the countries situated on the west of the Mississipi, and of which the destiny will in the lapse of ages have a powerful influence on the state of the northern provinces of Mexico. In order to obtain an accurate knowledge of the *area* of the United States, we need not wait for the period when 174,000 square leagues are trigonometrically surveyed. It is by means simply astronomical, by the combination of a great number of observed latitudes, and *chronometrical lines* traced in different directions, that we can rapidly obtain precise statements, indispensible in every good administration. Amidst so much uncertainty, it were to be wished that the Congress of Wash-

ington would collect the materials already obtained, in order to fix by calculation, I do not say the *area* of every state and every territory, but the total *area* of the four great natural divisions comprehended between the coast of the Atlantic Ocean, the central chain of the Alleghanies, the course of the Mississipi, the Rocky Mountains, and the Pacific Ocean.

The population in the English possessions in the neighbourhood of the United States, is now perhaps one-seventh greater than I supposed, in the table p. 142. It was computed, in 1814, in Lower Canada, 335,000; in Upper Canada, 95,000; in New Scotland, 100,000; in New Brunswick, 60,000; in Newfoundland and at Cape Breton, 18,000; in all, 608,000 inhabitants. (*Carey and Lea, Historical, Chronological, and Geographical Atlas of America*, 1822, N° 4.)

In order to facilitate the reductions of surfaces, we shall here repeat that a square marine league (20 to a degree) is 11·9716 English square miles (of 69·2 to a degree), or 1·5625 square French leagues (25 to a degree), or 0·5625 geographical square leagues (15 to a degree), or 9 Italian square miles (60 to a degree).

NOTE F.

Occupied by astronomical determinations on the southern frontier of the Spanish Guyanas, I had great interest, during my travels, in collecting all that has any relation to the disputes concerning the limits between the crowns of Portugal and Spain. This information was necessary in order to complete the memoir I addressed on my return from the Orooноko, to the first secretary of state, Don Mariano Luis de Urquijo (See above, Vol. v, p. 299, 413; Vol. vi, p. 351).

Without pretending to give a complete history of these *Commissions of boundaries*, which the ignoble artifices of European diplomacy have prevented from being more useful to the astronomical geography of the New Continent, I shall here succinctly publish the ideas which may throw light on that question; and of which those that relate to the negotiations of the 18th century, are taken from unpublished pieces preserved in the archives.

The discussions concerning the boundaries between the courts of Madrid and Portugal, have lasted during three centuries. They at first touched only on maritime interests, the possession of islands and coasts; by degrees they have extended to the interior of South America. The celebrated bull of pope Alexander 6th (May 4th, 1493) in favor of Spain, was made in the same spirit as the less known bull of the year 1445, issued by pope Nicolas 5th in favor of Portugal. The former places the line of demarcation an hundred leagues east of the Islands of Azores and Cape Vert, and gives to the Spaniards all that on the west of that line had not been occupied before Christmas in the year 1492. It says confusedly enough, *centum leucas a qualibet insularum quæ vulgariter nuncupantur de las Azores y Cabo Verde.* Cardinal Bembo, who, in his classical style, proscribes all new denominations, simply says, *Gorgonum insulæ*, no doubt (*Pliny* according to Xenophon de Lampsaco, lib. 6, c. 31, *Mela*, lib. 3, c. 9,) the *Gorgades (domus, ut aiunt, aliquando Gorgonum)* opposite the Byssadium Promontarium. The island of Saint Anthony is, no doubt, in the meridian of the island of San Michael, but there are 6° of longitude from the meridian of the most western island to the meridian of the most eastern of the Azores. A new bull of the 24th November, 1493, leaves the same doubts; but in the treaty of Tordesillas (June 7, 1494), the meridian of the demarcation was carried to 370 leagues, instead of 100, from the Cape Vert islands. The measure of the leagues not having been indicated, the

linea divisoria reaches, according to different hypotheses, the mouth of the Rio Francisco, or Rio Janeiro, or the meridian of Saint Paul, which is still placed 1° to the east of Grand Para. Pope Julian sanctioned the treaty of Tordesillas by a bull issued January 24th, 1506; but the daring voyage of Magellan, and the discoveries (1500—1504) of the mouth of the river Amazon, by Vicente Janez Pinson, of Cape San Augustin, by Amerigo Vespucci, and the ports of Santa Cruz and of the Bahia of Todos Santos, which had preceded that voyage, engaged the courts of Madrid and Lisbon to assemble in 1524, the *congress of pilots and cosmographers* at the bridge of Rio Caya, between Yelves and Badajoz. The Spaniards accused the Portugueze of having altered the distance from Gilolo to the coast of Brazil, and prove victoriously that the Moluccas belonged to the Castillian domains. The celebrated mathematician Faleiro, had taught the pilots the lunar methods by which they might determine the distance of a ship from the line of demarcation, considered as a first meridian. This line contributed no doubt powerfully to the ardor with which at that period the proper methods were sought, of finding the longitude by precise means. The congress of cosmographers at *Puente de Caya* went on slowly, and the disputes between the two nations respecting the possessions of the archipelago of India, only concluded by a treaty at Saragossa, the 22d of April, 1529. (*Don Juan y don Antonio de Ulloa, Dissert. historica y geographica sobre el meridiano de demarcacion. Madrid*, 1749; *Salazar de los progressos de la hydrografia en Espana*, 1809, *p.* 115. *Cespedes, Hydrografia, cap.* 4, *p.* 128, 143, 152). Spain ceded the Moluccas for the sum of 350,000 ducats, reserving the right of again possessing itself of the property of those islands whenever the amount of the purchase should be returned. The union of the two crowns under Philip 2d, calmed for some time national hatred, or rather compelled it to appear to be appeased; but from the end of the 17th

century, the establishment of *la Colonia de San Sacramento*, near the mouth of the Rio de la Plata, gave rise to disputes respecting the Brazilian limits. The Spaniards destroyed this settlement, and a new congress of cosmographers assembled at *Puente de Caya*, which lasted from the 4th of November [1681], to the 22d of January, 1682. It had been stipulated at the beginning of the negociations, that if they were not settled in the space of three months, they *should be submitted to the decision of the Sovereign Pontiff*. When we consider the state of the world an hundred years before the declaration of independence of the United States, we are tempted to doubt what is proved by the most authentic documents preserved in the archives. It was uselessly discussed, whether the 370 leagues mentioned in the treaty of Tordesillas, formed 22° 14′, or a less number of degrees, and whether that distance ought to be reckoned in the archipelago of Cape Vert, from the centre of the island of Saint Nicolas, or (as the Portugueze insisted), from the western extremity of the island of Saint Anthony. According to these detached arguments, the cosmographers of Lisbon sought to carry the *meridiana de demarcacion* 13 leagues west of the reconstructed settlement of San Sacramento. The congress of la *Puente de Caya* separated without having decided any thing, and the points in litigation were not submitted to the sovereign Pontiff as had been agreed. During the feeble reign of Charles 2d, the Portuguese gained every where upon their neighbours in America, on the side of Paraguay, on the banks of the Amazon, and on the Rio Negro. By the peace of Utrecht, Spain renounced the possession of San Sacramento. Nearly forty years passed in the most complete inactivity on the part of the ministry of Madrid, when Queen Barbara, daughter of John 5th of Portugal, sought to avail herself of the extreme weakness of her husband Ferdinand 6th, king of Spain, in order to be useful to her country, and terminate the struggle respecting the limits in South

America, in favor of the court of Lisbon. The chief of a squadron, Don Josef de Yturiaga, was named director (*primer commissario*), of an expedition intended to sail along the northern frontier of the *Capitania general* of Grand Para, enter the Amazon by the Oroonoko and the Rio Negro, and go up the Amazon as far as the province of Maynas, and perhaps even pass by land to the confines of Paraguay. (See the correspondence of Loefling with Linnæus, in *Jotri Loeflingi Iter Hispanicum eller Resa, til Spansza Landerna uti Europa och America*, 1758, p. 84—90). The expedition set sail from Cadiz, February 15th, 1754, having on board a chemist, a naturalist, and a geographer. The naturalist was the celebrated Loefling, who, after having examined the country round Cumana and Nueva Barcelona, the missions of Piritu and Caroni, died the victim of his zeal, at Santa Eulalia de Murucuri, (Linnæus calls this village Merecuri, Surville, Mucururi,) a little to the south of the confluence of the Oroonoko with the Rio Caroni, the 22d of February, 1756. Eturiago made the necessary preparations for the projected navigation on those rivers, in the island of Trinidad. He entered the mouth of the Oroonoko, at the end of July, 1754, with 53 small craft. (*Golitas, Lanchas, Piraguas*) and *Changunas*.) Dysenteries and fevers made great ravages among the troops, and even several hundred Indians fell sick. The fortress of la Vieja Guyana could only be reached on the fifteenth day. (See above, vol. v, p. 756 and 831, &c.) They went up no less slowly as far as Cabruta, near the mouth of the Rio Apure. Several barks imprudently exposed to the sun on the beach, split; the fevers continued, and rowers (*bogas*), boats, and money were at the same time wanting. Two of the commissaries, Don Eusebio de Albarada, and Don Joseph Solano, went to Santa Fe de Bogota in search of funds; they came back after six months' absence, in 1756. Solano alone, with a small part of the expedition, passed over the great cataracts of Aturés and May-

pures. He did not go further than the mouth of the Rio Guaviare, where he founded San Fernando del Atebago (Vol. v, p. 210, 299, 525, 846, and MS. of *Don Apollinario Diez de la Fuente*, which I took from the archives of the province of Quixos, south east of Quito). We have already shewn in another place, that the astronomical instruments of the *expedition of the boundaries*, were neither carried to the isthmus of Pimichin, to the Rio Negro, to the Cassiquiare, or the Alto Oroonoko, above its confluence with the Guaviare and the Atabapo. This vast country, in which no precise observation had been attempted before my journey, had at that time been visited only by some soldiers who were sent by Solano on discovery, and by Don Apollinario de la Fuente. He constructed a small fort with trunks of trees at the point of the bifurcation of the Oroonoko, entered the Rio Padamo to visit the Catarapene Indians, and founded the mission of the Esmeralda, with the Maquiritares, from whence he made a fruitless excursion towards the Rio Gehette, and the Cerro Yumariquin (Vol. v, p. 575, 582). Don Apollinario, whose name I have often heard pronounced by the Indians of Rio Negro, and the Esmeralda, affirms, in his journal preserved at Quito, that at the departure of the expedition of Solano (1754), consequently ten years after the voyage of Father Roman (Vol. v, p. 488, &c.), many persons in the island of Trinidad still doubted of the communication of the Oroonoko with the Amazon, and that they had no precise idea of the existence of the Cassiquiare, and of its junction with the Rio Negro.

While Don Josef Solano made efforts to pacify the Upper Guyana, Yturiaga remained on the banks of the Lower Oroonoko. This chief of the *Commission of the boundaries*, had, it is asserted, secret orders to prevent any definitive conclusion of a treaty. He wished to please the minister of the Indies, Areiaga, and above all, the successor to the crown of Spain, Don Carlos, who reigned at Naples. That prince

could not openly oppose the projects of his mother Queen Barbara, and the Portugueze party; the treaty, it was known, would be hostile to the interests of Spain, and all that remained was to gain time in creating obstacles. The craft constructed to convey the remainder of the troops beyond the cataracts, on the frontier of the Capitania general of Grand Para, were ready to sail, and the orders of King Ferdinand the 6th were precise. Yturiaga caused a *Te Deum* to be sung at Muitaco (Vol. v, p. 689, &c.) and during the ceremony, set fire clandestinely to the fleet, which was said to have been burnt accidentally. But so little pains had been taken to conceal this stratagem, that it was instantly discovered. The Portugueze commissaries offered to send their own boats for Yturiaga, but he answered that he would wait for orders from Madrid. Ferdinand 6th, wearied of the expence and the delays of Yturiaga, recalled the expedition. Solano and Albarados embarked, I believe in 1761, at La Guayra, for San Sebastian. Yturiaga, after having long inhabited the small town of Muitaco, where he hoped to re-establish his health, died at the island of Marguerita. The complaints made against him by the monks, and by his colleagues the other commissaries of the boundaries, embittered the latter part of his life. Don Apollinario Diez de la Fuente returned from Spain to the Oroonoko with the pompous titles of *Capitan poblador del Alto-Orinoco y Cabo militar del Fuerte de Cassiquiare*; he was afterwards made governor of the province of Quixos, and *Cosmógrafo de la real Expedicion de limites del Marañon*. If we may judge from his manuscripts, the cosmographers assembled at the congress of Puente de Caya, in 1524, were better informed than this emissary.

The labors of the commission of the boundaries of the Oroonoko which I have just related, were also as fruitless as the treaty signed January 12th, 1750, at Madrid, by which the Portugueze and Spanish nations re-

nounced the line of demarcation, and promised to recognize no other limits between Brazil, Buenos Ayres, and Peru, than the ridge of some mountains, and the course of the rivers. This convention declared formally "that it was impossible to fix by observations of longitude the line of demarcation on the coast, and in the interior;" a confession the more singular, as Don Jorge Juan, and Don Antonio de Ulloa, had proved, in a learned memoir (*Dissertacion historica y geografica sobre el meridiano de demarcacion entre los dominios de Portugal y de España*), published after their return from Quito, in 1749, that the limit ought to be fixed by the tenor of the treaty of Tordesillas, and according to two modes of interpretation of which that treaty is susceptible, either 1° 50′, or 3° 14′, on the east of the town of Grand Para. The convention of 1750 was renewed and confirmed at Madrid, October 11th, 1777; but the execution of stipulations made without local knowledge, and in consulting only very imperfect maps, was attended with greater difficulties. Nothing more was attempted on the side of the Oroonoko, and the Rio Negro; the whole attention of the two courts was directed towards the limits of Paraguay, and the banks of the Caqueta, the Rio Blanco, and the Amazon. The Brigadier Don Jose Varela, was sent (1782—1789) to Montevideo, M. d'Azara to Paraguay, and M. Requeña to Maynas. However incomplete the labours of the commissaries have remained, it cannot be doubted that astronomical geography will derive great advantages, if not the results only of their investigation are made public, but the observations on which those results are founded. The map by Azara of Paraguay, and those of Brazil, executed at Rio Janeiro, by order of the minister of marine, Don Rodrigo de Souza Coutinho, in 1804, by the captain of a frigate, Don Antonio Peres da Silva Pontes Lemos, have been rectified according to a part of those observations; but the longitudes being all chronometrical, the discordance in the time pieces of the Spanish

and Portugueze geographers, and the uncertainty of the positions which served as points of departure, threw great confusion on this determination of the boundaries. The court of Madrid, wearied of the expence and delay, dissolved the commission in 1801; and some years afterwards, the military occupation of the cisplatine province by the Portugueze, put an end for a long time to the discussions respecting the longitude, and the dilatory exceptions of diplomacy.

Note G.

In making known to the learned of Europe the physical properties of the *cow-tree* (see above, Vol. iv, p. 212, 226, 261; Vol. vi, p. 211), I had compared its nourishing milk, not with the juice of plants that abound in caoutchouc, like the juice of the Hevea, but with the milk of the Papayer. I had tried some chemical experiments on the latter, which appeared to me a strongly animalized substance. Two of my friends, MM. Boussingault and Rivero, whose important labours I have already had occasion to mention (Vol. vi, p. 219, and 253), and who are much better versed in chemistry than I was at the period of my voyage, have recently made the chemical composition of the juice of the *Palo de Vaca*, completely known. The following is an extract of the analysis sent to me by those chemists in a letter from Maracay (between Caraccas and Nueva Valencia), dated February 13th, 1823.

"The milk," says M. Boussingault, "which we have analized at your desire, is produced by the *Palo de Leche*, or the *Vaca*. This tree grows in abundance on the mountains that command Perequito, situated north-west of Maracay. This vegetable milk possesses the same physical properties as that of the cow, with this difference only that it is a little more slimy. It has also the same taste, but its chemical proper-

ties differ sensibly from those of animal milk. It can be mixed with any proportion of water, and, in that state, does not coagulate by ebullition, nor is it curdled by acids, like the milk of the cow. Instead of being precipitated by ammoniac, it is rendered more liquid, and this character indicates the absence of caoutchouc; for we have observed that in the juices containing this principle, ammoniac precipitated the smallest quantity, which when dried, possessed the properties of elastic gum. Alcohol slightly coagulates the milk of the cow-tree: it is something less than a coagulum, for the alcohol only renders it more difficult to filtrate the juice. The new milk lightly reddens the heliotrope; it boils at the temperature of 100°, and at the pressure 0^m 729. Undergoing the action of heat, it presents at first the same phenomena as the milk of the cow; a pellicula forms on its surface, which prevents the disengagement of the aqueous vapours. In raising successively the pellicula, and making it evaporate at a mild heat, an extract is obtained resembling a kind of paste; but if the action of heat is longer continued, oily drops are formed which augment in proportion as the water is disengaged, and end by composing an oily liquid, in which swims a fibrous substance that dries and hardens as the temperature of the oil augments, and spreads a smell like that of fried meat. Vegetable milk is separated by the action of heat into two parts; one fusible, of a sacculent nature, the other fibrous, of an animal nature. If the evaporation of the vegetable milk is not carried too far, and the fusible matter is not boiled, it may be obtained without alteration. It has the following properties; it is of a yellowish white, translucid, solid, and resists the impression of the finger; it begins to melt at 40° centigr.; and, when the fusion is complete, the thermometer indicates 60°. It cannot be dissolved in water, but is dissolved easily in essential oils; with which it also combines, and forms a composition analogous to cerat; alcohol at 40°, dissolves it totally, by

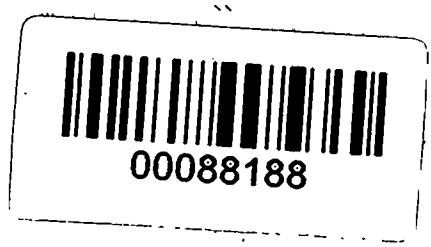
ebullition, and it is precipitated by cooling; it is *saponifiable* by caustic potash; and, when put into ebullition with ammoniac, forms a soapy emulsion. It is dissolved by hot nitric acid, with a disengagement of nitrous gas, and forms oxalic acid. This matter appears to us to resemble hot bees-wax, and it may serve for the same use, for we made it into wax candles.

"We obtained the fibrous matter by evaporating the milk, pouring off the melted wax, washing the residue with an essential oil to carry off the last portions of wax, pressing the residue, and making it boil for a long time with water in order to volatize the essential oil. Notwithstanding this operation, the smell of the essential oil cannot be altogether taken away. The fibrous matter thus obtained is brown, because it is no doubt somewhat altered by the high temperature of the melted wax; it has no taste, and put on a hot iron, turns, swells up, melts, and is carbonized, spreading a smell of broiled meat. If treated with a diluted nitric acid, a gas is disengaged from it which is not nitrous gas; the fibrous matter is transformed into a fat yellow mass in the same manner as muscular flesh, when azote gas is prepared by the process of M. Bertholet. The alcohol does not dissolve the fibrous matter, and we have employed that liquid to obtain it without alteration. In treating the extract of vegetable milk by the reiterated action of spirits of wine, and pouring off the hot liquor, the matter is at length obtained in white and flexible fibres; in that state it dissolves easily in diluted hydrochloric acid. This substance has the same characters as the animal fibrine. The presence in vegetable milk of a product which is only found ordinarily in the secretions of animals, is a very surprising fact, which we should announce with great circumspection, if one of our most celebrated chemists, Mr. Vauquelin, had not already found the animal fibrine in the milky juice of the Carica Papaya. It remains to examine the liquid which, in the milk of the *Palo de*

Leche, holds in suspension, in a state of chemical division, the two principles which we have recognized above, the wax and the fibrine. The vegetable milk, poured on a filter, passes with the greatest difficulty; but if alcohol be added, it forms a slight coagulum, and the liquid passes more easily. The liquor, when filtrated, reddens the heliotrope, and deposits no crystals. Evaporated to the consistence of a syrup, and treated with rectified alcohol, it left a little saccarine matter; but the principal mass was not dissolved. The indissoluble portion in the alcohol had a better taste; when dissolved in water, the ammoniac forms a precipitate, as well as the phosphate of soda. We thence presumed that it contained a magnesian salt; in fact, a drop of the solution being placed on a plate of glass near another drop of phosphate of ammonia, when mixed together, characters have been formed, by means of a glass tube. It is known that this *writing-property* belongs to ammoniaco-magnesian phosphate, and the process to Dr. Wollaston. We thought that an acetic acid was combined with magnesia; but the sulphuric acid did not disengage the smell of vinegar; it formed a sulphate, and carbonized the liquor: we are therefore ignorant of the nature of this acid. The matter which remains on the filter has the aspect, when dried, of unrefined wax, and melts, exhaling the odour of meat. The vegetable milk left to itself becomes sour, and acquires a disagreeable smell. During this alteration carbonic acid is disengaged; and an ammoniacal salt is also formed, for the potash disengages volatile alcali. Some drops of acid prevent putrefaction.

"The constituent parts of the milk of the cow-tree are; 1st. wax; 2d. fibrine; 3d. a little sugar; 4th. a magnesian-salt which is not an *acetate;* and 5th. water. It contains neither caseum, nor caoutchouc; but we found by incineration, silica of lime, phosphate of lime, and magnesia. Such is the summary of the experiments made by M. Rivero and myself on this nourishing juice. The presence of fibrine ex-

plains the nutritive property of the *Palo de Leche.* With respect to the wax, we are ignorant of the effect it produces ordinarily on the animal economy; in this instance, experience proves that it is not hurtful, since we estimated the quantity at half the weight of the vegetable milk. The cow-tree would be cultivated with advantage were it only in order to extract the wax, which is of an excellent quality; and would be a new source of wealth to add to the fine agricultural productions of the vallies of Aragua." I ardently wish that those able chemists MM. Boussingault and Rivero, may continue their labors on the milky juices of the equinoxial plants.


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